

CHIROPRACTIC
DIAGNOSIS

FIRTH

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1 - atlas

2 - axis

3 } M.C.P. Middle Cerv. Place
4 }
5 }

6 } L. Cerv. Place.

7 } A.P. Arm Place
1 }

2 } H.P.

3 } Lung. P.

4 } Liver P.

5 } Center Place

6 } S.P. Stomach Place.

7 }
8 }
9 S.P. Spleen P.

10 } T.K.P.

11 }
12 }

1 } U.P.P. Upper Private P.

2 } Private P. P.P.

3 } L. P.P.

4 }
5 }



JAMES N. FIRTH, D. C., PH. C.

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ON

Chiropractic Diagnosis

OR THE

Manifestations of Incoördination Considered
From a Chiropractic Standpoint

By

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By JAMES N. FIRTH, D. C., Ph. C.

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PREFACE

The first edition of Chiropractic Symptomatology written in 1914 was well received by the profession. This is also true regarding subsequent issues of the old work. It was written in condensed form and enabled the student to gain the Chiropractic idea of diseased conditions without exhaustive searching and extensive notes. The scope of the work has been greatly enlarged by the addition of several new sections on physical examination of the patient. These new sections makes the book more useful to the student and also to the field practitioner. Not only are the physical findings stated but the process of making the physical examination is clearly described and the significance explained.

The aim of this volume is to enable the student and Chiropractor to become more fully equipped in dealing with human ills. It is highly essential for the Chiropractor to know the location and nature of the diseased condition before he can explain its existence or even presume its exciting causes. The average Chiropractor is well informed on primary cause of disease and this is well indeed. He must continue to be well versed on this subject if he is to succeed. However, his usefulness will be enlarged as he broadens his knowledge on the nature and extent of diseased processes, and views all of the etiological factors rather than one. It is hoped this volume will serve to assist the practitioner in thus enlarging his usefulness.

The author is indebted to Drs. H. E. Vedder and A. G. Hinrichs for assistance and cooperation in preparation of the manuscript on the sections dealing with examination of the Respiratory Organs and examination of the Abdomen. Dr. S. J. Burich has also lent great assistance in proof reading the new manuscript and indexing the volume.

JAMES N. FIRTH.

Dedication

Chiropractic is judged by the people who represent it and the things they do and say. As a science it stands today exactly where its representatives stand. The progress it has made has been made by the few thousand Chiropractors representing it throughout the world. Most of them are striving to improve themselves and their methods so that their science will receive the public favor that its efficacy justly merits.

To the members of the Chiropractic Profession, who have made Chiropractic what it is and who are striving to improve it, is this volume dedicated.

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List of Abbreviations Used

Upper Cervical—First Four Cervical.

At.—Atlas.

Ax.—Axis.

C.—Cervical.

M. C. P.—Middle Cervical Place.—3, 4 and 5.

L. C. P.—Lower Cervical Place.—5, 6 and 7.

A. P.—Arm Place.—Region of the First Dorsal.

H. P.—Heart Place.—Region of the Second Dorsal.

Lu. P.—Lung Place.—Region of the Third Dorsal.

Li. P.—Liver Place.—Region of the Fourth Dorsal.

C. P.—Center Place.—Region of the Fifth Dorsal.

S. P.—Stomach Place.—Region of the Sixth, Seventh and Eighth Dorsal.

L. S. P.—Lower Stomach Place.—Region of the Eighth Dorsal.

Spl. P.—Spleen Place.—Region of the Ninth Dorsal.

K. P.—Kidney Place.—Region of the Tenth, Eleventh and Twelfth Dorsal.

Upper Lumbar—Region of the First and Second Lumbar.

Middle Lumbar—Region of the Second, Third and Fourth Lumbar.

Lower Lumbar—Region of the Fourth and Fifth Lumbar.

SECTION 1

INTRODUCTION

"You do not know enough the moment you believe your education is over. You cannot teach after you stop learning. No allegiance is paid to inefficiency. No matter who you are or what you do—doctor, lawyer or merchant—your guidance will be deserted, your counsel avoided and your wares rejected in the face of better brains or brands."

The structure of the human body is composed of four different kinds of tissue, known as the elementary tissues. They are named epithelial tissue, connective tissue, muscular tissue and nervous tissue. Nervous tissue is the most delicate, most sensitive and most highly developed tissue in the human body. The greater portion of this nervous tissue is located in the cranium, and is called the brain. The brain is composed of two kinds of matter—gray and white matter. The white matter is arranged on the inside, or forms the center of the brain, while the gray matter is arranged on the outside, forming the convolutions. There are millions of nerve fibres arising from this mass of nervous tissue, called the brain, most of which converge toward the base of the skull and form the spinal cord, which is, in fact, a prolongation of the brain. In the spinal cord the gray matter is arranged in the inside, forming the anterior and posterior horns or cornu, and the white matter is arranged on the outside in the form of tracts, as different parts of it are called. The spinal cord passes down through the neural or spinal canal, and gives off the spinal nerves. These spinal nerves are given off in pairs and are 31 in number. The cord proper ends at a point opposite the first lumbar vertebra. It then becomes flattened and spreads out into what is called the Cauda Equina (horse's tail).

After having passed through the sacrum there are only two small filaments or fibres of the spinal cord left, each of which is attached to the cornu of the coccyx and forms the filum terminale.

The spinal nerves make their exit from the neural canal between the vertebrae, through small openings called intervertebral foramen. After passing through the intervertebral foramen they divide into an internal and an external division, which again divide and sub-divide until small nerves are distributed to all parts of the body, there being no part that you can prick with a needle without producing pain, showing the density of nerve distribution.

The next question that arises is, what is the use or function of all these nerves, spinal cord and brain? The answer of which we all know in a more or less vague way. But before answering this question let us look at man in a different way.

A real live man does not consist only of matter—that is, bone, flesh and blood. There is something more that makes this man alive, that actuates his every action, that causes his heart to beat, his lungs to breathe, his stomach to digest, his bowels to function, his kidneys to excrete, his glands to secrete, etc.; this something is called force, mind, instinct, intuition or Innate Intelligence. It is something not tangible, something that you cannot see, taste, hear, smell or feel; nevertheless, we must all admit its presence or existence—the existence of mind (Innate Intelligence).

The seat of the mind is the brain, and it is there that all impulses are generated. The impulses are transmitted over the spinal cord and nerves to all parts of the body, where they are expressed as life. Therefore the mental impulses are essential to life.

The mind is of different kinds, or is considered in different ways. There are mental faculties over which we have control educationally, and in a general way may be spoken of as the educated mind; but in my estimation it is only the expression of the Innate mind in certain portions of the brain

which gives rise to the mental faculties, such as perception, memory, reasoning, etc.

There is also what you may call brain force, mental force or instinct, but throughout the following pages we will speak of it as Innate or Innate Intelligence, and it is this force that has to do with the development and growth of the body. This is abundantly proven both by experiment and by accidents that have occurred. We know that when the spinal cord is severed in the cervical region that instant death is produced, while severing the cord in the lower part of the spine produces death to the body below that point.

On the other hand, when we place our fingers in contact with any substance, we have a sensation by which we tell whether the object is smooth or rough, hard or soft, hot or cold, round, square or oblong. In this instance we get an impression from the object by touch, getting the impression on the tactile corpuscles in the fingers. These impressions are carried by the spinal nerves and spinal cord to the brain, where they are interpreted. The sensation is referred back to the ends of the fingers, so that it appears to us that we are feeling with the tips of the fingers; however, interpretation of the sensation really takes place in the brain.

There are different sets of nerves, one set which conveys impressions from its periphery to the brain and are called afferent. The other set conveys impulses from the brain to the periphery and are called efferent.

The electrical analogy is very often used in explaining Chiropractic.

The dynamo generates electricity which runs the motor. This electricity is conducted from the dynamo to the motor by a wire called the positive wire, so called because it conveys the current from the dynamo. The current is returned to the dynamo from the motor through a wire called the negative wire, so named because it conveys current to the dynamo. It is necessary to have this complete material circuit before electricity can be utilized in running the motor, and it is the

same in the human body. The brain corresponds to the dynamo, the efferent nerves correspond to the positive wire, the tissues to the motor and the afferent nerve to the negative wire. It is necessary not only to have a complete material circuit through which the immaterial works, but it is also necessary that there be unhindered transmission of this immaterial over the material circuit. For example, you have the brain sending out mental impulses which pass over the efferent nerve to the stomach, where they are expressed in the function of digestion. That is, the brain furnishes the stomach with the power with which it carries on digestion. The afferent nerves in the stomach are constantly taking up impressions from the stomach which they conduct to the brain for interpretation, which gives to the brain information of what is occurring in the stomach and the quantity and quality of impulses needed to carry on this process normally.

Now, should this nerve passing to the stomach become pressed upon or impinged at the point where it leaves the spine by a slightly displaced vertebra, the transmission of the impulses or function of the nerve will be impaired, and the stomach will fail to receive the proper amount of force with which to perform its function of digestion. This, then, would be called indigestion, and could only be corrected by relieving the impingement at the intervertebral foramen by proper adjustment of the partially displaced or subluxated vertebra.

The product of the activity of the mental impulses in the human body is called metabolism. Metabolism is defined as the tearing down and building up process of living material, and consists of two parts—anabolism and katabolism. Anabolism is the building up process of living material and katabolism is the tearing down process of living material. There is a combination of three things necessary to carry on this process. We take food in the mouth, masticate it, mix it with saliva and swallow it, it passes into the stomach where it undergoes gastric digestion then the portion still remaining

undigested passes into the small intestine, where it undergoes intestinal digestion. After it has been thoroughly digested it is ready for absorption which occurs by it passing through the mucous membrane by a process of osmosis; after this it is carried to all parts of the body, and it is necessary that this food be in all parts of the body in order to carry on a process of metabolism. Secondly, it is necessary that we have a supply of oxygen in all parts of the body at all times. This is obtained through the process of respiration. The lungs are so constructed and the blood is so composed that oxygen is taken from the air and carbon dioxide is given off from the body to the air in exchange. The red corpuscles of the blood contain a substance called haemoglobin, which gives to the red cells their color, and this substance has an affinity for oxygen. This is the oxygen carrying agent of the blood. The blood is carried by the systemic vessels, and they are distributed to all parts of the body by a fine network of capillaries. Thirdly, mental impulses are essential to metabolism, for it is the mental impulse that causes the oxygen to unite with the food, transforming it into living material, of the kind normal to the organ in which the metabolism occurred. If there should be a lack of this mental impulse, then there would be deficient metabolism.

The kind of disease produced depends upon the quantity, quality or combination of function abnormally expressed, for it is found that different nerves convey mental impulses which, when expressed, give rise to different functions. There are certain nerves that have to do with the motor function, involving the tonicity and movability of muscle. There are other sets that have to do with the sensory function. Still other nerves called trophic nerves, which have to do with the nutrition. Summing them all up, we find that there are five primary functions. Every disease, regardless of its character, can be analyzed as an abnormal expression of one or some combination of these functions. For example, you may have a case of flaccid paralysis of the arm, showing an ab-

normal expression of the motor function. A numbness of the fingers, showing an abnormal expression of the sensory function, or you may have a chilliness of one arm, indicating an abnormal expression of the calorific or heat-producing function. And as you will see in future pages, all diseases can be similarly analyzed.

The Primary Functions Defined

1. **Motor.**—That function which has to do with the tonicity of muscle fibres.

2. **Calorific.**—That function which has to do with the production of heat in the body; the heat-producing function.

3. **Sensory.**—That function which has to do with sensation or feeling.

4. **Secretory.**—That function which has to do with the formation or transformation of fluids by glands in the body.

5. **Nutritive—or Trophic.**—That function which has to do with the building of living cells. It is the function expressed in the process of anabolism.

The **Excretory** function is that which has to do with the elimination of waste material or valueless substances from the body. It is not a primary function. Sweat is secreted by small glands in the skin and is excreted from the body. The urine is secreted by the kidney and eliminated from the body. Sweat and urine are both excretory substances but they are both formed by the same process that forms saliva or gastric juice. Saliva and gastric juice are of value to the body in preparing foods for bodily use, hence they are termed secretions. Sweat and urine contain bodily poisons and their retention would be harmful, hence they are excreted from the body and are known as excretions.

Reparatory function is that which has to do with the repair and rebuilding of exhausted cells. It is not a primary function as it cannot exist without the function of nutrition.

Reparation is a process that cannot be denied but its existence as a primary function is highly improbable.

Expansive function has to do with the growth of new tissue and the formation of new cells. It is also dependent upon the trophic function, hence cannot be classed as a primary function.

Reproductive function has to do with reproduction of the species. It is not a primary function any more than digestion or circulation. Digestion is dependent upon normal secretion of gastric juice, normal temperature and normal movement, so is reproduction dependent upon normal secretion of ova and sperm, normal temperature, normal nutrition and movement. Digestion is the result of action of the digestive organs, so reproduction is the result of the action of the reproductive organs.

A pathological condition is a diseased condition, and knowing that disease is the result of an abnormal expression of function, it then can be determined what function or functions are abnormally expressed and an equation can be formed for the disease. An equation is an expression of equality, and can be best illustrated in this connection by taking an example.

We have the blood, composed of red and white corpuscles and serum. From our study of physiology and anatomy we learn that this blood is normally found only in the blood vessels, and that the walls of these blood vessels are composed of minute muscular fibres. These fibres are arranged in three layers, longitudinal, transverse and oblique. These muscular fibres are held closely together by connective tissue and have a certain degree of tonicity or elasticity, which tends to prevent the blood from escaping through the walls of the vessel. In a given case we have the diagnosis of epistaxis, or nose bleed, in which condition the blood has escaped from the blood vessels in the mucous membrane of the nose. Ordinarily we say the blood vessels have ruptured, and most of us have but

a vague idea of what constitutes a rupture. The vessel wall is not torn nor destroyed in any way, but there is a marked relaxation of the minute muscular fibres which permits them to separate, thus allowing the blood to ooze out between the relaxed fibres. Just so long as there is 100 per cent of the motor function expressed in all muscular tissue, then there is the proper degree of tonicity in all muscular fibres, but if there should be an impingement upon the motor nerves which emit from the middle cervical region and are distributed to the capillaries of the nose, thus causing an expression of this function below par of normal, there is relaxation. If the relaxation is slight, there is merely congestion, or hyperaemia; if the degree of relaxation is greater, there may be stasis, and if the degree of relaxation is very great, there is prolapsis and separation of the muscular fibres, with a resulting hemorrhage. Then, we can say that nose-bleed is simply an abnormal expression of the motor function, and its equation is motor minus. Similar equations can be formed for other conditions.

In case of tactile anaesthesia of the hand, there is a loss of sensation. The cutaneous surface of the body contains little organs, called end organs, in which the sensory nerves terminate. These end organs of the finger tips are called touch corpuscles or end bulbs and are the parts which come in contact with the stimulus. A stimulus is an external agent. These end organs receive impressions from the stimulus which are transmitted over the afferent nerve to the brain, where they are interpreted, and through the interpretation we get the knowledge as to whether the object is smooth or rough, hot or cold, round or square, etc. The sensation is then referred back over the sensory efferent nerve to the part receiving the stimulus, which makes it appear that the sensation occurred in the fingers. Should there be a subluxation of the first dorsal vertebra, impinging these sensory nerves and preventing their normal function, there will be anaesthesia, and the equation will be sensory minus.

Should the kidneys fail to properly eliminate the urine and should it be retained in the body, it will produce a dropsical condition because of decreased excretion. In such a case the equation is excretion minus. Likewise, an atrophied arm is the result of depraved nutrition, and its equation is nutrition minus.

Function is the expression of the mental impulse in the cell. Mental impulses, however, are something that cannot be measured. We have instruments for measuring the tonicity of muscles, for registering the blood pressure, etc., but as yet there is no instrument which will measure the mental impulses passing over a nerve or measure the vitality of a patient. We know there are times and we know there are conditions which, upon observation, appear to be the result of an excess amount of function. For instance, we know that fevers do appear, and fever is any temperature above 99.5; and we know that in fever there is an excessive heat in the body. We know there are times when the muscles are abnormally tense, or in a condition of hypertonicity; we know there are times when the glands become enlarged from overgrowth of tissue. Then the question arises, is this excessive heat produced by an excessive quantity of mental impulses—that is, more than 100 per cent of mental impulses passing over the nerve and being expressed in all parts of the body? Is this muscle contracted because of the expression of more than 100 per cent of motor impulses?

We also know that this fever or excessively high temperature, that this muscular hypertonicity and that this tumorous growth can be restored to normal through Chiropractic adjustments, as it has been done in the past; therefore we know that the cause of the trouble is a vertebral subluxation. In other words, we know there is a vertebral subluxation that is producing pressure upon the nerves and thereby interfering with the expression of the calorific function and producing fever; we know there is a vertebral subluxation producing pressure on the nerves, interfering with the motor function,

thereby producing the hypertonicity of the muscles; and we know there is a vertebral subluxation producing pressure upon nerves and interfering with the expression of the function of growth, thus producing the tumorous condition of the thyroid gland, known as goitre. Further, we know that in each of these three instances adjustments have been given and have restored the conditions to normal. That in itself is sufficient proof that the vertebral subluxation is the cause of excessive expression of function.

The question still arises as to how can the vertebral subluxation produce excess expression of function when in other cases it produces a lack of function. Whatever answer may be given to such questions is purely a matter of theory. Mind is something immaterial, cannot be measured and cannot be considered in the same way as matter, therefore it is necessary for the mind to deviate slightly from materialism and look at the question broadly. It is not necessary for the student or reader to accept any of the theories presented here in order to adopt the Chiropractic idea as applied to the various diseases in future pages; in fact, it is much better for the practitioner to reason for himself and to formulate such theories as are satisfactory to his mind rather than to accept the theories as set by others.

At one time the theory was held that a heavy pressure upon a nerve deadened or paralyzed that nerve so that it was incapable of carrying impulses, and as a result there was a lack of function in that part to which such nerve was distributed, but a light pressure which might only irritate the sheath of the nerve trunk would, because of such irritation, become over stimulated and cause excess function. If this theory were true it would be necessary to have a medium pressure in order to have normal function, and this could not be, for normal function is carried on only under normal circumstances, and it is not normal to have pressure of any kind on the spinal or other nerves.

The theory has been offered that if the afferent nerve be

impinged the brain will be unable to receive the impressions from the tissues, and will thus be unable to properly regulate the supply of mental impulses to the part according to the demand made by it. Hence at times when the organ is at rest and not working the demand for force is slight, and yet a large and over supply of impulses may be received, which when expressed gives rise to excess function of the part, while at other times when the organ is busily engaged at its normal work it fails to receive the normal supply of impulses with which to carry on this work at the required rate of speed. This theory may have some weight in explaining the intermittency of some diseases, but does not satisfy the production of excess function.

Another theory that has been frequently mentioned is that all apparent excess function is only comparatively so because of a lack of other functions. That is, in order to notice no defects in a part of the body it is necessary to have all functions expressed in a normal ratio, so that the calorific, secretory, nutritive, etc., be all equal. Now if the local subluxation should impinge all the nerve fibres except those carrying calorific impulses and the calorific impulses go along unhindered and be expressed in the part, it will result in excessive heat. This theory may be carried much farther, but this will serve to set you thinking along this line, which is all that is intended.

As a fourth theory, which closely resembles the preceding one, we will take an example for illustration. The thyroid gland is a ductless gland which forms an internal secretion which, hypothetically we will say, is one pint where the gland is receiving 100 per cent of mental impulses of all the nine primary functions. In order to carry on this secretion it will require the life of a certain number of secretory cells, for in all organs tissue cells are becoming exhausted and have to be replaced by new cells. As long as the thyroid gland receives 100 per cent of mental impulses of each of the nine primary functions, the development, multiplication and growth of these

cells is carried on at a rate that will keep the quantity of secretion at one pint in 24 hours. Now suppose that the individual should receive a subluxation at L. C. P. and produce a pressure upon the secretory nerves to such an extent that the secretion is diminished to $\frac{3}{4}$ of a pint in 24 hours, then less cells will be utilized in the total secretion. In other words, it would not require nutrition, expansion, reparation and the other functions to be expressed at the same rate of speed as when the gland was secreting one pint; that is, the less work the less is the force required. However, because of the local subluxation, adaptation is not permitted to take place, and the multiplication, growth and nutrition of the new cells is carried on at the former rate, while the cells are not being used as rapidly. The result is that these surplus cells will accumulate, because they are being formed faster than they are used, and in time will form an enlargement of the gland, which is commonly called "goitre." This theory may be true in many instances and may even hold good in all tumors, yet there are many other instances of excess function where it cannot be applied. ✓

Lastly, we know that bodily growth and health depends upon the normality of metabolism, which is governed by the expression of mental impulses in all tissues of the body. This being true, excess function is the result of abnormal metabolism in some part, and the manner in which it is abnormal may depend upon the function involved, the degree of pressure and the organ in which the abnormality exists. For example, take a case of simple fever. According to Butler, "Heat production (thermogenesis) depends upon the destructive metabolism, mainly processes of oxidation, which are constantly going on throughout the body. The skeletal muscles and the glands, especially the liver, constitute the chief seats of heat production."

"Heat dissipation (thermolysis) takes place mainly through the expired air, and by conduction, radiation and evaporation from the skin. As from 77 per cent to 85 per cent

of the total heat loss passes off from the cutaneous surface, the skin must be considered as the principal factor in heat dissipation. As the normal temperature of the body varies within such narrow limits, there must be some means of regulating the relative amounts of heat production and heat dissipation in order that they may balance each other with exactness and under widely differing circumstances."

Although Butler further states that the nerve centers, the mode of operation and the paths through which this heat regulation is accomplished is not as yet determined, our results have proved that Chiropractors have at least discovered the nerve paths and their mode of operation to such an extent that a single adjustment will restore the bodily temperature to normal even when there is a very high fever. Accepting Butler's hypothesis to be true, it is only a question of what produces destructive metabolism that remains until the question of excessive heat is settled.

This is again laid to the subluxation basis, that pressure upon nerves prevents the normal flow of impulses to the part, therefore prevents the normal conversion of food into cells, by-products being given off, which, when becoming oxidized, give off abnormal heat. Therefore it does not require more than 100 per cent of caloric impulses to cause fever, for, in fact, according to this theory the calorific nerves themselves might be impinged. Excess function is simply a manifestation of abnormal chemical action within the body, such chemical action being directly controlled by Innate Intelligence when permitted to do so, or when there is no impingement upon the nerves which would hinder this control.

Proper adjustment relieves the pressure on the nerve, permitting the normal transmission of mental impulses, which produces normal metabolism and normal chemical action as a result.

During the process of adjustment, however, the pressure is removed, but gradually. This would change the character of metabolism each day or each time the pressure was

altered, which in turn would alter the character of the symptoms. Many would expect that as the pressure is reduced the symptoms will ameliorate and disappear, but, as a matter of fact, they only change in character. Oftentimes a most severe pain will occur when there is but very slight pressure, or a temporary paralysis may exist when there is but very slight pressure; thus, as the subluxation is adjusted the condition which it has caused may be so changed as to give rise to more painful symptoms, which, of course, are only temporary. This change in the character of the symptoms, due to a change in the pressure on the nerve, is called "retracing."

Then, again, many patients take adjustments a long time before observing any results, and wonder why it is that others get immediate relief while their personal case responds so slowly. This is a question that confronts every Chiropractor, and the answer depends largely upon a personal knowledge of the case. But in the great majority of cases the momentum of disease should be given thought, as therein is contained an ample explanation, even though the case be of short duration. After a disease has started and acquired a certain momentum it cannot be stopped immediately, any more than a railroad locomotive will immediately stop when the throttle is closed. In the case of the locomotive, the momentum which it has acquired in its run must first be overcome, then it can be brought to a stop. In the engine of disease the same is true; it may require many adjustments in some cases to overcome this momentum before the progress of destruction can be checked, after which the metabolistic process will become constructive and the patient will notice improvement.

The Meric System

The spinal cord arises from the brain and passes downward through the neural canal of the spinal column. As it passes downward it gives off spinal nerves in pairs, 31 in number, which are distributed to all parts of the body. After pro-

longed experiment and manifold clinical observations, the meric system has been established. The meric system is a classification of the zones, and a zone consists of one of the segments of the spinal column, together with the pair of spinal nerves, emitting superior to this segment and all tissues to which such nerves are distributed. For example, the sixth zone comprises the sixth cervical vertebra, the sixth pair of spinal nerves and all tissues to which this pair of nerves is distributed. For convenience the zones are subdivided into smaller divisions called the meres. A mere consists of all of any one given kind of tissue in a zone; for example, the first neuromere comprises all the nerve tissue in the first zone, the eighth ossimere consists of all the bone in the eighth zone, the tenth vasomere is all the blood vessels in the tenth zone, the dermamere is all the skin of a zone, the myomere is all the muscular tissue of a zone, the viscemere is the viscera of a given zone, and the vertemere is the vertebra of a given zone.

The meric system is only approximate, however. When we speak of an organ as being in the 4th, 10th or 8th zone it is only approximately so, because of the slight variations that do occur in the body. For example, you may find a severe case of liver trouble, and by adjustment of Li. P., or the 4th dorsal vertebra, results may be obtained, but in two other identical cases the 4th dorsal vertebra may not be subluxated, therefore would not be adjusted. Upon careful palpation it is found that the 3rd dorsal vertebra is subluxated in the one case and the 5th dorsal vertebra in the other case, and after adjusting these 3rd and 5th dorsal subluxations the patients recover from the trouble. This is because the nerves leading from the brain to the organs of the body do not follow the same exact course in every individual. The same is true of the blood vessels, as can be seen in the superficial veins of the back of the hand. In one case we might adjust 4th cervical vertebra for eye trouble, and in another identical case we might adjust the 3rd cervical vertebra and obtain results in both cases. In one case of appendicitis we might adjust

2nd lumbar vertebra and in another case the 3rd lumbar and obtain results in both cases. So rather than stating a specific vertebra as being the cause of a given effect, it will be spoken of as a region. For example, Li. P. means liver place, and means in the region of the 4th dorsal vertebra, S. P. means stomach place, and will include from the 6th to the 8th dorsal vertebrae, etc. See table in meric system book.

At this point the student should familiarize himself with the meric system.

SECTION II

PRELIMINARY CONSIDERATIONS

Diagnosis is that branch of science which teaches the act or art of determining the presence of disease by means of signs and symptoms. It also includes any conclusion reached. The word literally means to know, to see through, to distinguish. The word diagnosis is commonly used in two separate and distinct ways. First, it is applied to that branch of science, a knowledge of which enables one to discriminate between the normal and the abnormal and the purpose of which is the determination of the location and nature of disease. Secondly, it is applied to the conclusion reached from the examination. In the former sense the practitioner uses diagnosis and diagnostic methods in his investigation, while in the latter sense he arrives at "a diagnosis," or opinion concerning the location, nature or cause of the trouble.

A diagnosis is therefore any decision reached, such as stomach trouble, indigestion, gastritis, spinal curvature or seventh dorsal subluxation.

The two major phases of diagnosis are physical diagnosis and symptomatology. Physical diagnosis is that division of diagnosis dealing with physical examination of the patient. The methods employed are inspection, palpation, percussion, auscultation, mensuration and sucussion. Any indication of abnormality discovered by any of these methods is called a physical sign.

Symptomatology is that division of diagnosis dealing with symptoms and their significance. A symptom is an abnormal physiological action, or it is a sign or manifestation of disease. Symptoms are objective and subjective.

Subjective symptoms are those which can be appreciated

by the patient only. They are sensory disturbances, such as pain, tenderness, fatigue, headache, nausea and vertigo.

Objective symptoms are those which can be detected by examination of the patient, therefore they are discoverable by the examiner. An objective symptom is a physical sign. The character and rate of the pulse, respiration, temperature, posture, color, facial expression, gait, spinal subluxations and curvature are examples of objective symptoms. Physical signs depend upon the physical nature and structure of the part examined and denote diseased conditions, not particular diseases.

A direct diagnosis is made when the case history and the clinical symptoms all clearly point to the one disease. It is commonly used in detecting lobar pneumonia, quinsy, mumps and a multitude of other common clear cut conditions.

A differential diagnosis is the determining of the essential characteristics between two similar diseases. A patient may present symptoms, many of which are common, in several diseases. The symptom groups of the several diseases suggested may then be compared with the case in question until all are eliminated but one.

A clinical diagnosis is one made at the bedside and is based upon the clinical picture and findings.

Anatomical diagnosis or post mortem diagnosis is one made after death and is based upon the anatomical tissue changes. This is of no practical value outside the laboratory.

Pathology is that branch of science which teaches the abnormal structural changes occurring in disease. The pathological changes may be microscopical or macroscopical. Microscopical pathology deals with those changes in the cell and other minute changes that can be seen only with the microscope. Macroscopical pathology can be seen with the naked eye. It is also known as gross pathology.

A neurosis is an abnormal function of a part without any discoverable pathological change. Neuroses affect the motor, sensory or secretory functions.

Chiropractic analysis is the determining of abnormal expression of function, what primary function is abnormally expressed, how it is abnormally expressed and what causes this abnormal expression. A knowledge of the structure and function of the body, both normal and abnormal, is necessary in order to make a Chiropractic Analysis. The analysis of a case is based upon information gained through interrogation and examination of the patient. The information thus gained consists of symptoms. Before these symptoms can be given their true value in the equation it is very essential for the student or practitioner to have a basic understanding of physiology, anatomy, pathology and diagnosis. Pathological changes are judged by the symptoms and signs unless the lesions are superficial and visible. Symptoms cannot be analyzed because they are elements of disease but they do suggest a diseased condition, the nature of which can be analyzed.

An **organic disease** is one in which there is discoverable change in the structure of the organ or tissue affected. A **functional disease** is one in which there is abnormal action but no structural abnormality. Functional diseases are also called neuroses.

Etiology is that branch of science which considers the cause of disease. Causes of disease may be classed as primary, secondary, predisposing, exciting, internal, external and specific. Of these the primary cause is the important one. Every diseased condition must have a primary cause that is fundamental. The primary cause is not only the first cause but it is also the chief or principal cause. It must exist before the others can be operative and is the one which concerns the Chiropractor most. The vertebral subluxation is the physical representative of the primary cause of disease. The primary cause of disease is interference with the transmission of impulses from the brain to the tissues. This lowers vitality and resistance and perverts function, which in itself is disease. It is a well-known and universally admitted fact that the first requirement for infection is "lowered tissue resist-

ance." Chiropractic offers the well-proven reason, interference with transmission due to nerve impingement. The presence of bacteria cannot be controlled by any healing profession but lowered tissue resistance, the primary cause of disease can be controlled by the Chiropractor through spinal adjustments.

A disease is said to be endemic when it prevails in a certain community more or less constantly. When a disease affects a great many people in a community it is said to be epidemic. A pandemic is a disease affecting very large areas or several countries at a time. A disease is said to be sporadic when there is but an occasional case in a community.

The period of incubation is the interval of time that exists between the entrance of poison into the body and the development of symptoms caused by its action.

A pathognomonic symptom is one found in but one disease, therefore it is a diagnostic sign of great importance. Examples are strawberry tongue in scarlatina, Koplik's spots in rubeola, Kernig's sign in epidemic meningitis and rusty sputum in pneumonia.

A complication is a diseased condition developing during the progress of the original disease, such as pleurisy with pneumonia. A sequel is a diseased process that results from the original disease and remains after it disappears, such as abscess of the lung when resolution fails.

Diathesis

A diathesis is a general or constitutional predisposition to certain forms of incoordination. This predisposition, however, is caused by vertebral subluxations, which, to a greater degree, are capable of causing the diseases to which the body is predisposed.

Tuberculous diathesis presents a tendency to tuberculosis and is most commonly found in individuals with long, slender bones, oval-shaped face, bright, pearly eyes, delicate skin and colorings, stoop shoulders and a hollow chest.

The gouty, arthritic or rheumatic diathesis presents a tendency to gout, arthritis or rheumatism, and is marked by a well developed body, a fleshy, round face, thick hair, good teeth, hearty appetite, strong heart, high blood pressure and a tendency to obesity.

The terms fatty, neurophatic, hemorrhagic diathesis are also used in connection with patients of these tendencies, but in no case does the diathesis indicate that the disease some time or other will be present.

Cachexia

Cachexia is a condition of pallor plus sallowness, resulting from the disintegration of the red blood corpuscles, due to malnutrition, and characterized by emaciation, debility and discoloration of the skin.

Cancerous cachexia develops in the course of cancer of any portion of the body and is marked by emaciation, debility, anemia, and a dirty, yellowish-brown color of the skin, which is most observable around the neck and the angle of the jaw.

Syphilitic cachexia occurs in the majority of syphilitic cases and is marked by anemia of a severe type and a muddy pallor of a yellowish-green tint, which is noticeable in the skin and conjunctiva of the eyes.

Posture

The posture of a patient in bed will vary with various diseases, and although many diseases may have the same posture, it is often of value to know the characteristic postures and what they indicate.

1. The dorsal strong or active posture is a posture of health and does not have any diagnostic importance. In this the individual lies comfortably upon the back, with legs extended and without any indications of pain.

2. The dorsal inert or passive posture is observed in febrile diseases in which there is great weakness, such as

typhoid fever. In this posture the patient lies upon the back, but is constantly slipping down toward the foot of the bed so that he soon acquires an uncomfortable position, which hinders respiration.

3. The rigid dorsal posture is commonly met with in acute diffuse peritonitis. In this posture the patient lies upon the back with both legs drawn up and the thighs flexed upon the abdomen to lessen the friction pain.

4. The lateral posture is one in which the patient constantly lies upon one side to favor respiration or comfort in some other way. This posture is commonly seen in unilateral pneumonia, pleurisy with effusion, enlargement of the heart and unilateral tuberculosis. In each case the patient lies upon the affected side to permit greater expansion of the unaffected side.

5. Opisthotonus, though not always considered a posture, is found as a characteristic symptom in a few diseases or conditions. It is a position in which the patient rests upon the back of the head and the heels, the trunk being arched forward. It is met with in tetanus, uremia and spinal meningitis.

6. Emprosthotonus is a posture in which the trunk is arched backward, the patient resting face downward upon the toes and forehead. It is found in tetanus and sometimes in hysteria.

7. Pleurosthotonus is a posture in which the trunk is arched laterally, the patient resting upon the side of the head and the side of one foot. It is also found in meningitis, tetanus and strychnine poisoning.

8. Orthopnea is the condition wherein there is the necessity of assuming the upright position in order to facilitate respiration. It is found in bronchial asthma, emphysema and heart disease, or in cases of fluid in the pleural cavity.

Gait

Every individual has a gait, or manner of progression, which is peculiar in itself or to that individual, but there are also various modes of walking peculiar to certain diseases, and will be considered here.

The **ataxic gait** is so named because of its presence in locomotor ataxia. The patient walks in a stooped posture with the eyes looking at the feet. The foot is raised unusually high and thrown forward with undue force and is brought down to the ground flat-footed with a stamp. While in the air, before being brought down, the foot wavers as if there is a degree of uncertainty in the wisdom of bringing it down. The patient walks with his feet wide apart and is constantly looking at them; this is done for the purpose of supplementing the loss of the tactile sense.

The **steppage gait** is also called the prancing or high-stepping gait, and is commonly found in infantile paralysis, multiple neuritis and paralysis, due to arsenic poisoning. In this gait the flexor muscles of the foot are the subject of a flaccid paralysis, so that the toes hang downward when the foot is raised from the ground. In order to prevent the toes from dragging upon the ground or from catching upon objects the foot is raised very high and brought to the ground forcibly before the toes can drop, thus the foot strikes the ground heel first. This gait resembles that of a man walking in tall grass, hence its name.

The **spastic gait** is common in diseases that have a spastic paralysis of the extensor muscles, and is common to spastic spinal paralysis, lateral sclerosis and some other forms of myelitis.

In this gait the legs are firmly extended, the foot is dragged along in a shuffling manner with the toes scraping upon the ground, and in order to permit one foot to pass the other the pelvis is tilted slightly. In some cases the adductors contract, causing the legs to cross, as is seen in Little's dis-

ease. In spastic hemiplegia there is a unilateral spastic gait, in which the pelvis is tilted and the leg is swung around in front of the other with the toes often scraping on the ground. This is also called the mowing gait.

Festination is the characteristic gait of paralysis agitans, or Parkinson's disease, and is also called the **propulsive gait**. In this the body and head lean far forward and the patient walks with short, hurried, shuffling steps, making it appear as if he is being pushed and is about to fall. It is difficult for a patient with this gait to stop suddenly or to turn a corner.

The **waddling** or **goose gait** occurs where there is extreme muscular weakness in the thigh and hip muscles, as is characteristic in pseudo-hypertrophic muscular paralysis and muscular atrophy. In this gait the shoulders are thrown backward, the lower part of the spine is in a state of lordosis, the pelvis is greatly tilted, and while thus raised the leg is brought around and placed upon the ground. When walking the patient swings from side to side in a very noticeable manner.

The **cerebellar ataxic gait** resembles that of an intoxicated person. The patient walks with the feet wide apart, takes short steps and sways to and fro to such an extent that progression is almost impossible. This gait is found in tumor of the cerebellum and disease of the semicircular canals of the internal ear.

Pain

Pain is an uncomfortable sensation resulting from the interpretation of impressions arising from an abnormal condition within the human body, or from an external stimulus, which has a detrimental effect upon the body. For example, take a sprained ankle in which the ligaments are stretched. There are sensory impressions constantly arising from this abnormal and sprained ankle. These impressions reach the brain, are interpreted, and efferent impulses sent out to the

point from which the impression originated, transferring the sensation to the periphery as pain. The sensation of pain, however, occurs in the brain. This pain is adaptative, to prevent further use of the injured part until it can be properly and naturally repaired. Or if the skin should be pricked with a needle, an impression is immediately sent to the brain, where it is interpreted as pain, and motor impulses sent back to the muscles, which causes them to contract and withdraw from the injury. In this the pain is also adaptative.

Pain may be classed as acute and chronic, and varies in intensity from sharp or acute to dull and aching. It may be local or general, according to the condition from which the impressions arise.

Acute pain usually begins suddenly, is of a severe character and indicates an acute inflammatory condition of nerves, nerve-sheaths, serous membranes, synovial membranes or an acute pressure upon nerves without inflammation. Of the former we have good examples in peritonitis, pleurisy, arthritis, appendicitis, cystitis, etc.

Dull or aching pain, as that found in case of a bruise, is found in acute inflammations of mucous membranes, or chronic inflammations of serous membranes. Dull pain is found in pharyngitis, gastritis, tonsillitis, acute catarrh, pyelitis, prolapsed organs and pressure from growths.

Both acute and dull pain may be intermittent or paroxysmal. A dull paroxysmal pain is usually produced by some irritant coming in contact with a chronic condition of some kind, such as food in chronic inflammation of the stomach, or the passages of the feces in ulceration of the intestine. Paroxysmal, acute pain is common in the neuralgias, gastric ulcer, rheumatism, neuritis and the lightning pains of locomotor ataxia.

Gnawing, burning or itching pain nearly always takes place in the mucous membrane lining the abdominal viscera, where the sensory nerves are less numerous. It is very char-

acteristic of cancer and may be located in any area in which cancer could appear.

Cramp is sometimes spoken of as belonging to pain, but occurs when there is excessive muscular contraction. Abdominal cramps are most common, and constitute gastralgia and enteralgia, in which there are spasms of the muscles of the stomach and intestines.

In all inflammatory diseases pain is greatly increased upon motion, because the dry and inflamed surfaces come in contact with each other and the friction thus induced produces intense pain.

Diffuse pain, as its name implies, is scattered over the entire body, not being located in any organ. It is common during the initial period of the acute febrile diseases, tonsillitis and rheumatism. When diffuse pain is located in the head it is spoken of as a general headache. Headache, however, may be localized, pointing to local causative subluxations.

A headache located in the forehead or over the eyes is spoken of as a frontal or eye headache, and is caused by a local subluxation in the upper or middle cervical region. A headache located in the region of the temples is called a temporal headache, and is usually caused by an Li. P. subluxation. A headache in the back part of the head is called an occipital headache. It may be caused by an atlas or axis subluxation, but is more frequently caused by a lumbar subluxation. A vertical or sick headache is the result and symptom of disorders of gastric digestion, and will be relieved by an S. P. adjustment. A headache at the crown of the head is more rarely encountered than any of the others, and indicates kidney trouble. It can be relieved by a K. P. adjustment.

Tenderness is a sensory symptom frequently met with, and may be defined as pain upon pressure, and although there may be a condition which would cause tenderness if pressure be exerted, yet no abnormal sensation will be felt so long as there is no pressure. It is upon this fact that nerve-tracing

is based—nerve-tracing being a method of following the course of tenderness over nerves that are impinged. Nerve-tracing will usually assist in locating the cause of pain, tenderness and headache.

Aside from pain and tenderness there is another classification of abnormal sensation, called paræsthesia. Paræsthesia is a perverted sensation or uncomfortable sensation not amounting to pain. The most common paræsthesias are weight or bearing down, coldness, faintness, formication or itching, fullness, girdle sensation, numbness and tingling, precordial constriction and weakness or debility.

The sensation of weight is most commonly found in the pelvis, and is more frequently met with in women than in men. It is symptomatic of prolapsus of the uterus, pelvic tumors or a falling of the abdominal viscera.

The sensation of coldness is present at the beginning of a fever or during the chill stage, but also occurs in a few cases in which the bodily temperature is normal. These are usually diseases of the nervous system, and the sensation only imaginary. It is met with in neuræsthenia, hysteria and chorea.

Faintness or syncope is a feeling of extreme bodily weakness with a cloudiness of the intellect, and occurs from cerebral anemia. This may be produced either by an H. P. subluxation in which the heart is affected to such an extent that the brain is not receiving sufficient oxygen to maintain consciousness, or may be caused by an atlas subluxation, in which the vasomotor nerves of the vessels of the brain are impinged, thus causing a spasm of these muscles and rendering a part or whole of the cerebrum anemic. It occurs in diseases of the heart, in hydrothorax, pleurisy with effusion, or sometimes as a result of great emotion, fatigue or excessive heat.

Formication or itching is a sensation as if insects were crawling upon the skin. It occurs in diabetes, jaundice and skin diseases. General formication is more common in cases of hysteria and neuræsthesia.

The sensation of fullness is most common when the abdomen is distended by gas or fluid, as in gastritis and ascites, or may be present when there is pressure by an enlarged or prolapsed organ.

The girdle sensation is an important and common paræsthesia met with in diseases of the nervous system. It is a subjective sensation of a tight band drawn around the waist. It is found in locomotor ataxia, creeping paralysis, myelitis and tumor of the spinal cord.

Numbness and tingling may occur in the feet during the initial stages of locomotor ataxia, apoplexy, tumor of the brain, spinal meningitis, neuritis, myelitis and neuræsthenia. It indicates the loss of the sensory function, and the above list is but partial.

Precordial constriction is a feeling of tightness in the chest, which is near to the point of suffocation and is met with in those diseases accompanied by intense dyspnœa, such as bronchial asthma, emphysema, angina pectoris, meteorism and heart trouble.

Weakness, or debility, is very common and attends the onset of all febrile diseases and appears toward the close of any disease. It may be especially marked in some diseases, such as diabetes, cancer, anemia, influenza, tuberculosis and neuræsthenia.

Vertigo, or dizziness, is a subjective sensation of a loss of equilibrium. When it appears that the patient himself is falling, rising or whirling, it is called subjective vertigo, and when the objects around the patient appear to be in the state of motion, it is called objective vertigo. Both subjective and objective vertigo may be classed as horizontal if present only when the patient is lying down. Horizontal vertigo always disappears when the patient assumes an erect position. Vertigo itself is always a symptom and not a disease. It may be found in disorders of the heart, liver and stomach and disease of the semicircular canals of the internal ear.

Disturbances of Consciousness

Consciousness is the ability of the mind to cognize impressions which are capable of producing physical or mental sensations. **Unconsciousness** is a condition in which there is no cerebral appreciation. The loss of consciousness may occur gradually or suddenly and may have varying degrees of completeness.

Somnolence is the slightest disturbance of consciousness, and is characterized by a marked tendency toward sleep, from which the patient can be easily aroused.

Stupor is a more decided loss of consciousness, in which the patient may pass, and from which he can be aroused only by extraordinary means.

Coma is the most severe form of unconsciousness, from which the patient cannot be aroused. **Coma vigil** is a severe and grave form of coma, in which the patient lies with his eyes open, but entirely unconscious of his surroundings. It may be accompanied by a low muttering delirium.

Delirium is a state of mental agitation in which the mind is extremely active and is characterized by incoherent speech, delusions and sensory perversions. Delirium may be **active** or **wild**, in which it is necessary to use physical force to prevent the patient from personal injury; or **mild** and **muttering**, in which the patient lies still, but busily engaged in his incoherent speech.

Wild delirium is commonly met with in delirium tremens, while mild delirium is more common in cases of extreme prostration in the course of high fever.

A **delusion** is an absurd and unfounded belief. An **illusion** is a false interpretation of impressions received from objects that really exist. An **hallucination** is a sense perception without a physical basis. Any or all of these various disturbances of consciousness may be found in the insanities or the typhoid status.

Coma

All forms of coma are characterized by a deep sleep from which the patient cannot be aroused, but each form has its peculiar symptoms by which it can be recognized and differentiated from the others.

Opium coma is a state of narcosis, resulting from the introduction of a large quantity of opium into the human body. In this the patient is deeply comatose, the pupils are contracted to pin points, the respirations are slow, varying from 12 to 4 per minute, the pulse is slow but strong and bounding, the face may be cyanosed because of the lack of oxygen, the cornea is insensitive and there is retention of urine, which, if prolonged, may cause the appearance of uremic symptoms.

Alcoholic coma results from the extreme overabundant use of alcoholic liquor, and the breath has a characteristic odor. It may or may not be possible to arouse the patient, and if he can be aroused he resents the interference with blows and incoherent speech, characteristic of drunkenness. The respirations are deep and of normal frequency, the pulse is strong, full and bounding, the pupils are of equal size and slightly dilated, the temperature of the surface of the body is subnormal, and there is absence of any paralytic symptoms, which is the most important point in the recognition of this coma.

Apoplectic coma results from intercranial apoplexy and is always profound, it being impossible to arouse the patient in any way. There is a hemiplegia, which can be determined by raising the limbs of each side and permitting them to drop. It will be noticed that the extremities of one side drop more flaccidly than the other. Upon straightening out the wrinkles of the face those of the unaffected side assume their former shape more readily than the affected side. The pupils are unevenly dilated, that on the affected side of the face being the larger. The respirations are of normal frequency but are labored, and there is blowing out of the lips to a

noticeable degree on the affected side. Cheyne-Stokes respiration may be present in some cases. The cornea is insensitive, the temperature is above normal, and the head and eyes may be turned toward one side.

Uremic coma occurs in cases of uremia and is often initiated by a uremic convulsion. The face has the characteristic renal pallor, and the face and legs may be swollen from the renal edema. The skin is dry, harsh and has a characteristic urinary odor. The urine contains albumin and casts and is greatly diminished in quantity, the respiration and pulse are irregular, the temperature may be normal, subnormal or febrile, according to the severity and extent of the incoordination from which the uremia develops, and there are muscular twitchings noticeable in the wrists and legs.

Epileptic coma follows the epileptic convulsion and is recognized by a history of an epileptic attack, blood-stained foam upon the lips, bruises upon the head that may have been sustained in falling at the onset of the convulsion, and by its brief duration. The entire duration of the coma may be less than half an hour, but in most cases lasts about one hour. The face is flushed and deeply cyanosed from the suboxidation of the blood, because of the tonic spasm of the respiratory muscles during the convulsion.

Diabetic coma occurs late in diabetes and may come on suddenly, with fainting in a debilitated case. The temperature is subnormal, the respiration is of normal frequency but labored, the pulse is full and bounding, there is a sweetish odor in the room, and the urine contains sugar. This coma is rarely mistaken, as it only occurs late in the course of diabetes mellitus, after the kidneys have become exhausted from continued overuse.

Coma from sunstroke is usually recognized by the circumstances under which the patient is found, together with an abnormally high temperature, hot dry skin, flushed face, deep, labored respiration, frequent and full pulse, and the profoundness of the coma.

Hysterical coma occurs in connection with hysteria and is more easily recognized after observation of a case than from description. The coma is preceded by an attack of hysteria, minor or major. The face is flushed, the respirations are rapid but not labored, the pulse is normal, the pupils are normal in size, equal, and respond to light, the cornea is sensitive, the eyeballs are upturned, the facial expression is characteristic, and the patient can be aroused from the coma by pressure upon the supra-orbital notch, by pinching the nose or by the inhalation of ammonia.

Convulsions

A **convulsion** is a series of contractions involving the voluntary muscles of the major portion of the body. A **spasm** is a contraction or series of contractions involving a single muscle or a certain muscle group. Convulsions and spasms may be either tonic or clonic. A tonic spasm is a continuous contraction of a muscle or muscles, as in trismus. A **clonic spasm** is marked by alternating contractions and relaxations of the affected muscles, as is seen in spasmodic torticollis.

Convulsions are common in epilepsy, hysteria, tetanus, uremia, strychnine poisoning, eclampsia, hydrophobia and lesions of the brain.

Epilepsy presents a striking example of both the tonic and clonic convulsions. The seizure is divided into two parts, the first being brief and of the tonic type, the second of the clonic type. Immediately preceding the attack the patient may have a premonitory symptom in the form of an aura, which may vary in different individuals, but usually consists of an imaginary vapor arising from the region of the knees toward the head, and when reaching the level of the head the patient gives a scream, the head and eyes are turned to one side and the patient passes into the tonic convulsion. In this the legs and arms are extended, the jaw is clenched, the hands are tightly closed and the respiratory muscles are fixed, causing suboxidation and consequent cyanosis. This tonic condi-

tion may last about a minute, when there is a relaxation, after which contractions and relaxations alternate. In this clonic part of the convulsion the muscles of the face, eyes and jaw work convulsively and the head and extremities jerk rhythmically. The action of the jaws may be such as to bite the tongue, causing the foam which forms in the mouth to be blood stained. There may be incontinence of the urine, involuntary movement of the bowels, and after two or three minutes' duration the patient passes into the deep epileptic coma.

Although tonic and clonic convulsions may occur in other diseases, the mode and manner of onset and the course of the convulsion will differ according to the disease in which it is present.

Pallor

Pallor is a common derangement in the color of the skin, consisting of paleness or duskiness and having different shades of degrees in different diseases. Pallor may occur suddenly or gradually and it may be permanent or temporary.

Temporary pallor is one which lasts but a short time and is produced by a vasomotor spasm of the cutaneous capillaries or by improper activity of the heart, where it becomes weak. Temporary pallor also occurs suddenly and can be overcome by an atlas or an H. P. adjustment.

Permanent pallor arises slowly and results from an abnormal condition of the blood itself, in which the hæmoglobin or the coloring matter of the red cells is deficient, or where the red cells themselves are lacking in number, or where there is a loss in the quantity of blood through hemorrhage. These conditions are very commonly known as anemia, and a person having pallor is said to be anemic. Pallor is found in connection with a great many diseases and it would be useless to name the list here. It is sufficient to say that pallor is found in all those diseases in which there is general malnutrition, hemorrhage, cardiac weakness or vasomotor spasm.

Cyanosis

Cyanosis is a bluish discoloration of the skin, due to an excess amount of carbon dioxide in the blood and a lack of oxygen. It may be produced by any condition which will prevent the normal manner of respiration or the taking on of oxygen by the red blood cells. All those diseases which would tend to hinder the passage of air into the lungs, thus producing obstructive dyspnoea, are important factors in the production of cyanosis. Examples of this class of conditions are seen in stenosis of the larynx, bronchial asthma, retropharyngeal abscess, etc. Any condition that would interfere with the expansion of the lungs, such as pleurisy with effusion, contraction of the diaphragm, pneumothorax, hydrothorax and emphysema may produce dyspnoea and cyanosis. Further, any condition which will interfere with the systemic or pulmonary circulation of the blood, so that it fails to get to the lungs to receive a fresh supply of oxygen, will produce cyanosis. This is most common in valvular disease of the heart, where there is regurgitation of the blood, thus failure of oxygenation. Cyanosis is plainly seen in the mucous membrane of the lips, beneath the finger nails and upon the mucous membranes of the mouth upon pressure.

Jaundice or Icterus

Jaundice is a yellowish discoloration of the skin, due to the presence of bile pigment. Normally, bile pigment should be found only in the biliary apparatus and the intestines, and only is found in the skin and fluids of the body when there is some obstruction to flow of bile from the liver into the intestine.

Jaundice may be of two kinds, mild or severe. Mild or simple jaundice is most commonly met with in temporary obstruction of the common bile duct by gall stones, catarrhal inflammation or pressure by a growth of an adjacent organ.

In such event the common duct is obstructed and the dammed-up bile is absorbed by the hepatic vein or passes from the liver by osmosis through the fluids of the entire body, particles of the pigment becoming lodged in the skin and giving rise to the yellowish discoloration.

Severe or grave jaundice is of long standing and occurs when there is a permanent obstruction of the common bile duct, such as may be produced by impacted gall stones in the ampulla of Vater, carcinoma of the gall bladder or liver, chronic cholangitis, pressure by tumor of the head of the pancreas, tumor of the pylorus or of the duodenum, or any other growth or obstruction of the common bile duct.

In simple icterus the discoloration of the skin is slight and it may be unaccompanied by any other symptom, but, as a rule, there are constitutional disturbances. The appetite is lost and there may be nausea and vomiting, the fecal matter is putty-like from the lack of bile, the urine is dark and contains bile pigment, the conjunctiva is yellowish, and it is here the jaundice is first seen. The individual feels drowsy, is unable to carry on his occupation, loses flesh and strength and may have a slight rise in the bodily temperature, a coated tongue, loss of taste and an offensive odor with the breath.

Icterus gravis or severe jaundice occurs when there is an obstruction of the common duct of considerable standing, such obstruction being nearly complete. It is marked by a deep jaundice, first noticeable in the conjunctiva of the eye and later appearing in the skin of the entire body. There are severe constitutional disturbances, such as emaciation, weakness, anorexia, nausea, vomiting, constipation with attacks of fetid diarrhoea, due to the decomposition of the feces from the lack of bile; dark, heavy urine containing bile pigment, and intense itching. There may or may not be a slight fever, and the pulse and respirations are slow. Li. P. and K. P. are adjusted in case of jaundice.

Skin Eruptions

Cutaneous or subcutaneous hemorrhages may occur as small spots, called *petechiæ*; or in large areas, called *ecchymoses*. This occurs as an eruptive symptom in cerebro-spinal meningitis and dengue, and is also commonly met with in scurvy purpura and hemophilia. It is produced because of a lack of motor function being expressed in the minute muscular fibres forming the blood vessel walls, permitting them to become relaxed, their fibres to separate and the blood to ooze out between the minute fibres.

Erythema is an evenly distributed redness of the skin, due to a cutaneous hyperemia, and is commonly found in erysipelas. **Exanthem** is a skin eruption in which there is an uneven redness of the skin of the body, and is commonly found in the exanthemata. The eruption of the exanthemata are spoken of as macular, papular, vesicular, pustular, and petachial, the latter being previously described.

A **macule** is defined as a flattened-out papule, or it is a small circular red spot, slightly elevated above the level of the skin, measuring from two to four millimeters in diameter, and may be scattered over the entire body densely or sparsely, but, as a rule, does not coalesce. It is the characteristic eruption of measles.

A **papule** is a rounded or ovoid hard elevation of the skin, and during its early appearance has a feeling like fine shot beneath the skin. They are usually reddish in color after they become fully developed. All pimples could be classed as papules. It is the characteristic eruption in the first stage of variola.

A **vesicle** is a slight elevation of the skin, containing a clear fluid or serum. It usually follows the papular stage of an eruption, and is found in the second stage of smallpox.

A **pustule** is an elevation of the skin, containing pus, and often follows the vesicular stage in an eruption. It is produced by suppuration of the serum that is contained in the

vesicle, giving to it a smoky or cloudy appearance. It is found in the third stage of smallpox.

A herpic eruption consists of a series of minute vesicles situated upon a reddened and hardened base, and attended by a burning or smarting pain. When occurring on the lips it is called herpes labialis and indicates an inflammation of the respiratory mucous membrane. When occurring on the nose, is called herpes nasi.

Furuncles, or boils, may be classed as a form of cutaneous eruption. They are circumscribed areas of suppuration in the subcutaneous tissue, and usually involve one or more of the sebaceous glands. At the onset it is red in color, but as soon as suppuration has occurred it becomes a yellowish-white. Boils may be general or localized, and in all cases K. P. should be adjusted. In case they are localized the local vertemere should also be adjusted.

Dropsy

Dropsy is a general term that is used in connection with any general or local condition, in which there is an excessive or abnormal accumulation of watery fluid in a cavity of the body, or where there is an infiltration of such fluid in the tissues of a part of the body. In case dropsy is localized in one part of the body, such as an extremity, it is called **edema**. When edema is general, involving the entire body, it is called **anasarca**, or general dropsy. When dropsy affects single cavities it is given a different name, according to the cavity affected. When there is an accumulation of a serous or watery fluid in the pericardium it is called **hydropericardium**; when in the peritoneum, it is called **hydroperitoneum**; when in the thorax, it is called **hydrothorax**, and when in the brain it is called **hydrocephalus**.

Anasarca, or general dropsy, is associated with edema, and in the great majority of instances dropsy of cavities is also associated with a local edema. The edema is readily recognized by the paleness of the skin, the swelling, shiny and

glossy appearance of the skin, and if pressure be exerted with the point of the finger over a hard or bony surface, pitting will occur. This latter symptom alone is sufficient for the recognition of edema. Edema may occur in connection with a great many different pathological conditions.

General dropsy occurs with a greater degree of frequency in connection with acute and chronic nephritis than in any other single pathological condition. In nephritis the kidney is affected, so that the excretion of urine is suppressed; the urine is therefore retained within the body, absorbed by other fluid and carried over the entire body, becoming deposited and filtrated throughout all its tissues. In such cases the adjustment is K. P.

Dropsy also occurs with much frequency in valvular disease of the heart, the valvular defect causing obstruction to the onward flow of blood, the result being venous stasis. When the stasis occurs there is a low pressure upon the vessel walls, and in order to lessen this stasis there is an adaptative osmosis of serum from the hyperemic vessel into the surrounding subcutaneous and cellular tissue. In such cases as this the specific adjustment is at heart place.

Local edema may be produced by pressure upon any of the veins draining the part, and occurs in connection with goitre, aneurism, thoracic and abdominal tumor. The obstruction is local and the edema occurs the same as in cardiac dropsy. Cardiac dropsy is always first noticeable in the feet and ankles, while renal dropsy is first noticeable in the face and beneath the lower eyelids.

Cutaneous emphysema is a rare condition, in which there is an accumulation of air beneath the skin, and in some instances may simulate dropsy or edema. It can be easily differentiated from edema, however, because of the fact that the swelling does not pit upon pressure, but the depressed skin follows the point of the finger back to its former shape as soon as the pressure is removed. There is also a fine crackling sound upon pressure, which is produced by the passage

of air through the subcutaneous tissue. This most frequently occurs in connection with emphysema of the lungs, where an air cell is ruptured and the air escapes along the trachea, forming a small tumor above the clavicle.

Symptoms Pertaining to the Digestive Tract

Anorexia is a decrease or total loss of the appetite for food. It is commonly met with in the febrile diseases and incoordinations involving the stomach. In such conditions it is not wise to force eating, as the appetite alone is the best guide for this. The cause of the anorexia in such cases is adaptative, because of the inability of the body to utilize food, hence the uselessness of taking it into the body and digesting it. In gastric disorders the appetite is lost because of the inability of the stomach to properly digest it. When in a state of disease the stomach is using all of its force, or mental impulses, for the purpose of reparation, and by forced eating a part of the force would have to be used to digest the food eaten. The adjustment for anorexia is not always S. P., but may vary according to the condition present, which is capable of producing this symptom.

Bulimia is an abnormal hunger or craving for food, and is observed in the stage of convalescence in the acute febrile diseases, in which anorexia has predominated for a long time. After the restoration of the body to health the body finds its need for food, the stomach is able to meet this demand in being able to digest the food, hence hunger prevails. Bulimia is more or less constant in and a cardinal symptom of diabetes mellitus.

Pica is a craving for articles which are not food, and which may be injurious to the body if eaten. It is most commonly seen in cases of insanity and idiocy. Occasionally it is present to a slight extent in pregnancy and chlorosis. In the latter there is often a craving for slate pencils, chalk, etc.

Excessive thirst is common in diseases attended by an

overexcretion of fluid from the body, either through the bowels or kidneys. Is found in diabetes, diarrhoea, cholera infantum, gastritis, xerostomia and all of the febrile diseases except typhoid.

Vomiting is the sudden expulsion of the contents of the stomach and is usually preceded by nausea. Vomiting is an adaptative symptom, and occurs when any substance or substances are in the stomach which it is incapable of digesting, or which, if digested, will be injurious to the human economy. For example, when a poison is taken into the stomach impressions are at once taken up by the afferent nerve and carried to the brain, where they are interpreted, and when Innate obtains such an interpretation she at once sends out motor impulses over the efferent nerve to the stomach, directing the act of vomiting, before the poison can be absorbed and do injury to the body. In vomiting there is a deep inspiration, the glottis closes, the cardiac end of the stomach opens by a contraction of the longitudinal fibres and the forcible expiratory contraction of the abdominal muscles follows, which causes the stomach to be emptied.

Vomiting occurring without the sensation of nausea preceding it is of cerebral origin, and indicates pressure upon the brain which is capable of interfering with the vomiting center.

Vomiting occurs in connection with a great many diseases and has a different character, according to the disease of which it may be a symptom. Vomiting occurs in all diseases of the stomach. Severe vomiting, which is very weakening to the patient, occurs in acute gastritis, and after the contents of the stomach have been emptied the retching continues with an expulsion of a watery fluid and of glairy mucus. In hypersecretion of gastric juice there is profuse vomiting of a thin watery fluid, the gastric juice, which contains the normal .2 per cent H. Cl. If the H. Cl. should exceed .2 per cent, the condition is hyperchlorhydria, and if the per cent is less, it is called hypochlorhydria.

Bilious vomiting occurs when the pyloric valve is affected and permits the regurgitation of the bile from the intestine. It is commonly called **biliousness**.

When vomiting occurs periodically every two or three days, at which time large quantities of partially digested food, with an abundance of fluid, is vomited, it indicates dilatation of the stomach. If such a vomitus be allowed to stand it will separate into three layers. The upper layer will consist of a froth which has formed during the fermentation in the stomach, the middle layer will consist of fluid, and the lower layer will consist of the sediment and solid undigested food. Such vomit has an offensive odor, indicating putrefaction.

Hematemesis is the vomiting of pure red blood, and occurs when there is perforation or rupture of a large vessel of the stomach or esophagus. Hematemesis differs from hemoptysis in that the blood is vomited, not coughed up; in that it is of a darker color, and in that it has an acid reaction, because of having come in contact and being mixed with the gastric juice.

Hematemesis, or red blood vomit, commonly occurs in connection with ulcer of the stomach, injury which will cause the rupture of vessels, from swallowed blood that has been coughed up and immediately vomited, and from the rupture of an aneurism into the stomach, which, luckily, occurs but seldom.

If a small hemorrhage should occur into the stomach the blood will not be vomited immediately but will lie in the stomach and be acted upon by the digestive juices. At a later period when it is vomited it has lost its red color and is turned to a dark or almost black color, hence is called **malena**, or coffee-ground vomit.

Coffee-ground vomit, or **malena**, is most common in and characteristic of gastric cancer, but also occurs in connection with small hemorrhages in gastric ulcer, chronic gastritis, yellow fever, atrophic cirrhosis of the liver, in which there is

portal obstruction, and other diseases in which the blood vessel walls are inelastic or abnormally relaxed.

Fecal vomiting occurs in connection with complete obstruction of the intestine and is preceded by an emptying of the contents of the stomach, then by the vomiting of bile having a fecal odor, and finally by the vomiting of the fecal matter itself.

Pus in the vomit indicates the presence of suppuration, occurring in the mucous membrane of the stomach or the perforation of the stomach wall by an abscess, its pus being discharged into the stomach.

Costiveness is a sluggishness of the bowels resulting from a lack of the normal secretions, which give to the feces its normal fluidity. Such a condition may be caused by a local subluxation impinging secretory nerves leading to any of the organs that give off a secretion to the intestinal tract. Also in diseases of the kidney in which there is excessive urination, whereby the body is deprived of its normal proportion of fluid, and in order to conserve the remaining supply, all secretions are inhibited.

Costiveness may occur when there is a lack of bile in the intestines, and is marked by a pale stool of a fetid odor, or it may occur when there is suppression of the secretion of the intestinal fluids, in which event upper lumbar should be adjusted.

Constipation is a sluggishness of the bowel resulting from deficient peristaltic motion, or it is a condition resulting from a lack of motor tonicity in the muscular fibres of the intestine. Constipation proper is always caused by a local subluxation in the lumbar region. The term constipation is, however, commonly, but wrongly used to include both costiveness and constipation. Constipation is a common symptom in various forms of paralysis and in individuals who have by prolonged use of laxatives overstimulated the activity of the bowels. Obstructive constipation occurs where there is any mechanical obstruction to the descent of the feces.

Diarrhœa

Diarrhœa is an increased frequency and an abnormal fluidity of the stool, in which there is either increased action of the nervous mechanism of the intestines or increased secretion into the intestinal tract.

Diarrhœa is a symptom rather than a diseased condition, and is most commonly found in affections of the intestinal tract where there is an abnormal increase in the amount of intestinal secretions, but may also be found in abnormal conditions of the liver, pancreas, stomach or kidneys, and is found in a few diseases of the nervous system where there is no indication of disturbances of the digestive system other than the diarrhœa.

The character of the stool will vary according to the condition producing the diarrhœa. It is a common symptom of enteritis, and in this affection the exudation from the mucous membrane is very profuse and tends to flush the bowels, giving the stool a mucous or muco-purulent consistency.

In cholera infantum the stools are large in quantity and of a serous consistency, the purging continuing almost constantly.

A thick **mucous** stool which is streaked with blood and evacuated with much straining and tenesmus is characteristic of acute dysentery, and if the dysentery becomes chronic the stool may remain of the same consistency, but will decrease in frequency.

A **green** stool containing a large quantity of undigested bile indicates a partial obstruction of the common bile duct, usually by a stone in the ampulla of Vater, which has a ball valve action.

A stool containing undigested **fat** is indicative of disease of the pancreas or obstruction of its duct, so the fat is not emulsified and acts as a lubricant, flushing the bowels.

A **black** stool containing digested blood indicates hemorrhage of the bowels, as occurs in cancer, the blood being altered by the digestive fluids.

Clay-colored stools indicate the absence of bile, and are found in those conditions wherein the bile duct is obstructed, and the bile being dammed back is soon absorbed, giving rise to jaundice. Bile is the normal antiseptic of the intestines, and when absent the fecal matter is often in a state of putrefaction.

Shreds of membrane consisting of transformed mucous is found in the stool in cases of diphtheric enteritis or in mucous colic, and indicates a phlegmonous inflammation of the mucous membrane.

Abnormalities of Urination

Dysuria is commonly known as painful or difficult urination, and occurs in abnormal conditions of the bladder or urethra, in which the mucous membrane is inflamed, the opening obstructed, or the organ pressed upon by a prolapsed viscus, and may also occur when the urinary system is normal but the urine is highly concentrated and highly acid, and the pain in such cases is produced by the irritation of the acid urine upon the delicate mucous membrane of the bladder and urethra.

In gonorrhea the mucous membrane is inflamed, red and swollen, the lumen of the urethra is decreased and the acid urine causes pain when coming in contact with the inflamed membrane. Dysuria is common in cystitis, cancer of the bladder, enlarged prostate gland, adhesions which prevent the entire collapse of the bladder, cystic calculi and neuralgia of the bladder.

Difficult or slow urination is found in those diseases wherein the lumen of the urethra is diminished in size, or in which the muscular walls of the bladder or abdomen have lost their normal tonicity and are unable to force the urine from the bladder. This, also, is present in enlargement of the prostate gland, as it compresses the urethra near the neck of the bladder.

Frequent urination occurs in those diseases attended with great thirst, which is satisfied by drinking large quantities of water, such as diabetes. But polyuria is also found in those conditions responsible for dysuria, and especially where the mucous membrane is easily irritated by highly concentrated urine. Dribbling of urine is not necessarily a form of polyuria, but is rather a condition of incontinence of urine.

Incontinence of urine is the inability to control the passage of urine from the urinary bladder through the urethra, and occurs when the sphincter muscle at the neck of the bladder is paralyzed. Nocturnal enuresis is a variety of vesical incontinence of this kind. Incontinence of urine may also occur in states of coma or unconsciousness, in which the volition is dulled or dormant, the act occurring adaptatively without the assistance of the will.

Retention of urine is an abnormal condition in which the urine is normally secreted by the kidneys, but is retained in the bladder because of constriction of the sphincters of the neck of the bladder, or because of vesical anæsthesia, as occurs in the various forms of sensory paralysis. In this latter condition the brain fails to receive impressions from the bladder, therefore does not know when the bladder is full or the urine should be voided, consequently does not send motor impulses to the muscles of micturation, which would cause them to contract, forcing the urine from the distended bladder. The adjustment for a condition of this kind is always local in the lumbar region, unless when resulting from some form of sensory paralysis whose pathology lies in the spinal cord. Retention of urine is common in locomotor ataxia because of the sensory disturbance, due to degeneration of the sensory tract in the spinal cord. The adjustment in such a case is usually at the atlas, but may be anywhere above the local zone of the bladder.

Suppression of urine is frequently confused with retention of urine, but is a condition in which the kidneys fail to

separate the excretory fluid from the other fluids of the body, thus permitting the urine to remain in the circulation of the bodily fluids. Suppression of urine is always the result of improper activity of the kidneys, therefore occurs in diseases of the kidney. This is well seen in Bright's disease, where there is anuria with a resulting dropsy, the dropsy being due to the excretory fluid becoming infiltrated in the tissue and spaces of the body. The adjustment for suppression of urine is always at kidney place.

Important Symptom Groups

Coma is the most profound state of unconsciousness, and is marked by stertorous respiration, slow pulse, insensitive cornea, dilated or contracted pupils, failure of the cornea or pupil to respond to light, and expiratory puffing of the cheeks and lips. The various forms of coma have previously been described, in which the characteristic symptoms of each form are mentioned. The above symptoms are common to all forms, with slight variations.

Dyspnœa is more commonly known as difficult breathing, and is characterized by a sense of thoracic discomfort or a sense of constriction in the chest, the respiratory rate is increased, the mouth is open, the nostrils are dilated, the face is cyanosed, speech is difficult, the skin may be cool, and there may be orthopnœa. This also has variations in form and severity.

Fever is a condition in which the bodily temperature attains 99.5 degrees or over, and all fever or feverish conditions are attended by a preceding sensation of chilliness or by a chill with rigors, an increase in the pulse and respiratory rate, increased thirst, loss of appetite, headache, backache and more or less general aching, general weakness, costiveness of the bowels, scanty and highly colored urine which contains an overabundance of solids. This increases its specific gravity, and sometimes there is nausea, vomiting and delirium, the

latter depending upon the height of the temperature. The adjustment for simple fever is C. P. and K. P.

Internal hemorrhage is sometimes difficult to recognize, but usually the blood makes its appearance at some orifice of the body, such as the mouth, nose, ears, rectum, vagina, or perforating wound.

Internal hemorrhage begins with pain which is localized at the point of hemorrhage, a sudden drop in the bodily temperature, and in cases of fever when the temperature drops to 95 degrees or less it is said to be indicative of internal hemorrhage, the face becomes pale and has an anxious expression with a fear of impending death, the surface of the body is covered with cool perspiration, and there is great hunger for air. The respirations are short, shallow and jerky, the pulse is feeble and rapid, the apex beat becomes weak and may finally become imperceptible, the radial pulse becomes weaker until unnoticeable, when death occurs. If the hemorrhage is large, syncope and sudden death result. In cases where the hemorrhage is small and continuous the symptoms may cover a period of considerable duration. Internal hemorrhage occurs with many diseased conditions. Among the most common are ulceration of the intestines, ulcer of the stomach, typhoid fever, rupture of an aneurism of the aorta, ectopic gestation, tuberculosis of any organ, occasionally in cancer of internal organs, and in hemophilia and traumatism.

Shock or collapse is a condition of sudden prostration occurring immediately before death. Its symptoms are very similar to those of internal hemorrhage; in fact, internal hemorrhage is marked by shock. The temperature is lowered, the pulse is thready, the respirations are rapid and shallow, the skin is cool and covered with perspiration, the face is pale and has an anxious expression, there is great weakness, and there may be delirium, stupor or coma.

Syncope is more commonly known as fainting, and results from cerebral anemia. This cerebral anemia may be caused by an atlas subluxation impinging the vasomotor nerves of

the cerebral arterioles, or by an H. P. subluxation, which interferes with the action of the heart. Fainting is marked by pallor of the face, quiet expression, imperceptible respiration and pulse, dilated pupils which are sensitive to light, and it is rarely fatal. The duration of fainting is short, but its effect may be weakening for some time.

Hectic fever is a name applied to the characteristic fever of suppurative tuberculosis. Hectic fever is characterized by pallor of the face with a circumscribed redness of the cheek, bright eyes, pearly sclerotic, clear mind, rapid pulse, rapid respiration, persistent anorexia, and a fever appearing in the afternoon and terminating during the night or early morning by crisis, with profuse sweating. This is the characteristic fever of tuberculosis.

The typhoid status is a state, or condition, of great prostration, in which the temperature is greatly elevated. It is commonly found in typhoid fever, from which it gets its name, but is by no means confined to this disease. In the typhoid state there is muttering delirium or coma, a dry dark-coated tongue, sordes on the teeth, subsultus tendinum, carphologia, extreme prostration or weakness, and a high fever. Very rarely this condition is found where the temperature is low in a fatal condition. The typhoid state is considered as a grave symptom and is unfavorable to recovery. It may occur in any of the high fevers, pyemia, abscesses and endocarditis.

Indications of Abnormalities of the Face and Head

Hydrocephalus, or dropsy of the brain, is marked by a large globular head. At birth the normal head is about 14 inches in circumference, and at one year of age it measures 18 inches in circumference. In hydrocephalus the circumference is much greater than the normal, as given above. The anterior fontanel is wide and bulging and is greatly delayed in closing, the sutures are wide and furrowed, the face appears

small in comparison with the enlarged head, and there may be strabismus.

The head of rachitis is sometimes mistaken for that of hydrocephalus, but in rickets the head is of square shape, the vertex is flattened; the caput quadratum is formed by the proliferation of the frontal and parietal eminences, the fontanelles are delayed in closing, but are depressed and not bulging, and there are alterations in the other skeletal bones.

Cretinism.—The head is large and of irregular shape, the fontanelles remain open as late as the tenth year, the face is broad and flat, the nose is broad and negroid, the eyes are situated wide apart, the mouth is open and the tongue protrudes. In addition to this it will be seen from the facial expression that the child is deficient mentally.

Hippocratic countenance is characteristic of acute diffuse peritonitis and cholera. In this there is a facial expression of extreme anxiety, the upper teeth are uncovered by the raising of the upper lip, the respiration is quickened and of the superior costal type, and the abdominal muscles are fixed.

In **exophthalmic goitre** there is a characteristic facial expression, due to the protrusion of the eyeballs. This is often so great that the lids are incapable of covering the eyeball, and the mobility of the eye is affected so as to interfere with vision of moving objects.

Paralysis agitans has a peculiar facial expression, known as **Parkinson's mask**. In this there is no change in the facial expression, with a change in the emotions of the patient. The lower lip droops and permits the flow of saliva from the mouth. There may also be a tremor of the lower lip.

A **puffy face** with bag-like swelling beneath the lower eyelid and a sallow color is indicative of renal disease. This is especially true when there is the presence of edema in the lower extremities and the presence of albumin in the urine.

Mouth breathing occurs when there is any obstruction to the passage of air through the nose or the naso-pharynx, and is commonly met with in adenoids or nasal polypus.

Spasmodic torticollis is also known as the clonic form of torticollis, and is marked by a spasmodic jerking of the head toward one side, the face being rotated toward the opposite shoulder and chin raised at the same time. In some cases the shoulder is elevated at the same time the head is drawn down. These movements recur every few minutes and are increased in frequency and force upon excitement. The condition may be caused by a local subluxation in the cervical region, and must be determined by palpation.

The **Argyll-Robertson Pupil** is a common symptom of locomotor ataxia, and is one in which the pupil does not respond to a change in the amount of light, but does in accommodation, or to the variation of distance of objects. This can be determined by shading the eye and suddenly flashing a light before it. If the Argyll-Robertson pupil is present, it will not contract nor change in size when subjected to the greater light. But when viewing objects at different distances will change according to the distance of the object under observation. This symptom may also be found in dementia paralytica or general paresis of the insane.

Ptosis is a drooping of the eyelid, and results from paralysis of the levator palpebræ muscle. Ptosis may be unilateral or bilateral, and is caused by a third or fourth cervical subluxation which affects the oculomotor nerve and diminishes the motor function of the paralyzed muscle.

Strabismus is more commonly known as cross-eye, and is the inability to bring the visual axes to bear upon one point at the same time. It may affect one or both eyes, and is due to a paralysis of one or more of the muscles of the eyeball. This is caused by a middle cervical subluxation. If the eyeball is turned toward the external angle of the orbit it is known as **divergent** or **external strabismus**; if the eyeball is turned toward the nose it is called **internal** or **convergent strabismus**.

Diplopia or double vision results when the visual axes are not properly adjusted to each other, so that the image of the

object observed falls on two different portions of the retina of each eye. It is usually caused by an upper cervical subluxation, and is a common symptom of locomotor ataxia and tumor of the brain.

When both eyes are turned toward one side and the patient is unable to voluntarily change their position, it is termed **conjugate deviation**. Such a condition might result from a paralysis of the internal rectus muscle of one eye and the external rectus of the other eye, or from some structural change in the center in the brain, as in apoplexy or tumor. The adjustment for this condition is usually atlas or axis.

Nasal Discharges

Discharges from the nose may be watery, mucous, mucopurulent, purulent or bloody. The former three are usually non-offensive, and the latter two may be offensive. They occur in the form of an exudation in inflammatory diseases of the mucous membrane lining the nasal passages.

Watery discharges are commonly found in the initial stage of coryza, acute nasal catarrh, hay fever, influenza, measles and whooping cough. This watery discharge occurs during the early stage of the inflammation, when the blood vessels are congested and the mucous membrane is swollen from the filtration of serum into its tissues. After the inflammation has been present for some time there is a slight change in the consistency of the secretion. It then becomes thick and mucous-like. This mucus is abnormal, however, and is very viscid. Later in the inflammatory process there is a slight degree of suppuration, with the formation of a few pus cells, which, when mixed with the mucus, gives to it a yellowish color, or it may only be streaked with the yellow pus cells. Such an exudate is known as **mucopurulent exudate**. Still later, when the degree of suppuration is more marked, as it is in atrophic rhinitis, the entire exudate is purulent in character and of a greenish yellow color. This is called a **purulent exudate**.

If the discharge has a very fetid odor and consist of offensive green crusts, it is indicative of atrophic rhinitis, syphilitic rhinitis or necrosis of the nasal septum, and is known as *ozena*. This *ozena* is especially characteristic of syphilis.

A bloody discharge may be either offensive or non-offensive, according to the condition from which it comes. If the discharge consists of pure blood, as in epistaxis, it is non-offensive, and results from a hemorrhage of the nasal capillaries. But if the discharge contains pus which is streaked with blood, it is usually offensive, and the hemorrhage is the result of an erosion of the small vessels lying in the affected mucous membrane.

Often in diseases having an offensive discharge the olfactory cells are destroyed and the sense of smell is lost.

The Mouth and Speech

The mouth and lips are frequently examined for objective symptoms of many diseases. The mucous membrane of the lips is very thin, so that the pallor and cyanosis is best seen here. Cyanosis indicating suboxygenation of the blood, and pallor a condition of anemia, which may be local and temporary or general, and if general will be confirmed by examination elsewhere.

Koplik's Spots are small red spots with a bluish-white center, which appear upon the inner surface of the lips and cheeks during the initial stage of measles and disappear upon the appearance of the cutaneous eruption. Many authorities say the finding of these spots is pathognomic of measles.

Herpes labialis, more commonly known as cold sores, are found upon the lips in respiratory catarrh or in disorders of the stomach. They are a symptom of considerable importance in lobar pneumonia, occurring in about ninety per cent of the cases. Herpes occurring on the lips may be removed by local adjustments in the cervical region, lower dorsal region, or S. P.

Unilateral deviation of the mouth may occur as a paralytic symptom of apoplexy or facial paralysis of any kind. In this the angle of the mouth is drawn to one side and downward, and upon respiration there is a flapping of the cheek and lips, which indicates the loss of motor power. Such a condition is produced by a local cervical subluxation, usually of the upper region.

The chancre of syphilis oftentimes appears upon the lips, is swollen and hard, and in the center there is a small ulcer. The lymphatic glands in the region of the neck will become painlessly enlarged and hard, and the secondary symptoms of syphilis will appear in the course of two or three months. The gums also may become pale or red and spongy, the teeth will become loose and sometimes fall out. This is also indicative of scurvy and mercurial poisoning.

Of the symptoms pertaining to the teeth, the only one of importance is the syphilitic screw-driver teeth. These teeth appear late or the child may be born with large teeth; they have a broad base and are narrow toward the edge. On the edge there is a single large notch. The teeth may, however, be small and situated far apart. They are also known as Hutchinson's teeth.

Aphonia is a loss of voice, and dysphonia is a partial loss of voice or hoarseness, and results from improper vibration of the vocal cords. This is a common symptom of laryngitis or croup, in which the cords are swollen and thick, and do not respond in vibration to the expiration of the air from the lungs. Aphonia is a more severe condition than dysphonia, and occurs in edema of the cords and retropharyngeal abscess, both of which are considered serious. However, complete aphonia will result from a lower cervical subluxation when the impingement is on.

This produces a loss of elasticity and tonicity in the fibrous bands, causing them to be widely separated, and attempts at phonation would be useless.

It is necessary to distinguish between aphonia and anar-

thria. The latter is a condition in which the voice is normal, but the sound cannot be formed into articulate words. Anarthria results from an abnormal condition of the organs of speech or from an abnormal condition of the speech center in the brain, or from the inability to hear. The form of anarthria will depend upon the muscles involved. When the lips are paralyzed it is difficult to articulate the labials, such as m, b, p, or f; when the tongue is paralyzed it will be difficult to articulate the linguals, such as l, n, r, s, t, or d; and when the palate muscles are the seat of the paralysis it will be difficult to articulate the gutturals, such as g, k, and the hard sound of c. The adjustment must be made according to the muscles involved.

Scanning speech, in which the words are spoken slowly and each syllable is accented as if reading verse, is a common symptom of multiple sclerosis and sometimes general paresis.

Aphasia is the inability to produce or comprehend speech, either written or spoken. This is always caused by an atlas subluxation which interferes with the function of certain educational centers in the brain. This will vary greatly in severity from slight mental defects to that condition found in idiocy, involving the voluntary action of muscles. Aphasia may be motor or sensory. Motor aphasia is a condition in which the individual understands what has been said and is capable of forming an intelligent reply, but is unable to recall the muscular movements of the organs of speech necessary to express his thought. Sensory aphasia may affect any of the special sense organs, but usually the auditory and visual senses. Visual aphasia would, then, be a condition in which the patient can see, but does not understand anything that he perceives through his eyes. Auditory aphasia is a condition in which the patient hears, but does not comprehend anything that he hears, as if listening to a foreign language.

Apraxia is closely associated with aphasia, and is the inability to recognize or understand the nature and use of objects, or the identity of individuals. There may be as many

kinds of apraxia as there are kinds of sensation, among which are mind deafness, mind blindness, mind anosmia and mind ageusia.

The majority of cases of aphasia and apraxia which are not symptoms of some disease are congenital in their origin, and in the vast majority of cases there is a history of difficult labor at childbirth, during which time the causative atlas subluxation may be produced. Many cases have been adjusted with remarkable success.

Cough

Cough is an important diagnostic symptom of disease of the respiratory apparatus, and may be classified as laryngeal, bronchial, and lung, depending upon the seat of the diseased condition from which the cough arises. Cough may also be classified as being dry, loose, paroxysmal, brassy or metallic and suppressed.

A dry cough is one in which there is little or no expectoration and may be accompanied by the expulsion of a pellet of mucus. A dry cough is found in the first stage of bronchitis, tuberculosis, asthma, whooping cough, influenza, or irritation of the respiratory mucous membrane by dust, or irritating substances.

A loose cough is one in which there is profuse expectoration of exudate. It is found in the advanced stages of all inflammatory diseases of the respiratory mucous membrane, especially so in bronchitis, pneumonia, whooping cough, and tuberculosis.

A paroxysmal cough may be either dry or loose, and is one that occurs at regular or irregular intervals. It is characteristic of whooping cough and bronchiectasis. In the latter there are sacculations formed in the walls of the bronchial tubes, which are filled with a purulent exudate. This collects during the night when the patient is in the recumbent posture; then upon arising the exudate overflows from the sacculations, passing down upon the healthy mucous membrane.

This irritates the healthy membrane and cough is adaptatively produced for the purpose of expelling the irritation.

A brassy or metallic cough always originates from the larynx, and is commonly seen in croup, laryngeal diphtheria and laryngitis. A suppressed cough may be either dry or loose. Cough is suppressed whenever respiration or the act of coughing is painful or exhausting. It is a common symptom of pleurisy, peritonitis, appendicitis, and muscular rheumatism. The cough is, however, adaptative for the purpose of removing some irritating substance from the respiratory mucous membrane.

Laryngeal Cough.—Laryngeal cough is usually of the brassy or metallic type, and from its sound it can be determined that its origin is high up in the throat. It occurs in diseases of the larynx, especially those in which there is inflammation and in those conditions which may produce pressure upon the inferior laryngeal nerve.

Bronchial Cough.—Bronchial cough, as its name implies, originates from irritation of the mucous membrane lining the bronchial tubes. It usually can be classified upon hearing the patient cough. There is a sense of constriction, or tightness, in the chest, more or less difficulty in breathing, and is more common in the winter months. A bronchial cough is very frequently paroxysmal. It is commonly found in bronchitis and other diseases directly affecting the bronchial tubes.

Lung Cough.—Lung cough, as its name implies, originates from interference with the normal function of the lungs. It is accompanied by a deep resonant sound and usually with profuse mucous or muco-purulent expectoration. A lung cough is found in pneumonia, pleurisy, cancer of the lungs, growths of the pleura, tuberculosis, abscess of the lungs, emphysema, and gangrene of the lungs.

Expectoration

The naked eye examination is made of the sputum to determine its composition, color, odor, and quality. Sputum is

usually scanty in dry inflammations of the bronchial tubes, pleura, larynx, and in asthma. Sputum is abundant in chronic inflammation of the bronchial tubes, lungs, and larynx. Sputum is also abundant in pneumonia, bronchiectasis, abscess of the lung, and gangrene of the lung.

Watery or serous sputum is found in the first stage of congestion of the lungs, bronchitis, bronchial pneumonia, and emphysema. This may also be frothy, because of containing small air bubbles, and may resemble water made frothy with soap.

Viscid sputum is thick, sticky and gelatinous, adhering to the retainer, and if the latter be inverted the sputa will still adhere to it. Viscid sputum is commonly found in pneumonia, fibrinous bronchitis, and tonsillitis.

Mucous sputum is clear and rather thick, resembling the white of an egg. It may or may not be viscid, and is found in pneumonia, tuberculosis, bronchitis, and whooping cough.

Muco-purulent sputum is found in the same diseases as mucous sputum, but indicates an advanced stage. The sputum is of a yellowish-white color, and is thick and sticky. It is colored yellowish by the presence of pus cells. It is most characteristically seen in acute bronchitis.

Purulent sputum is composed of pus. It indicates a suppurative process occurring in the bronchi or the lungs. It is a symptom of putrid bronchitis, abscess, and gangrene of the lungs.

Rusty sputum may be mucous, muco-purulent, or viscid, and is of a rusty-red color, which it receives from the blood with which it is mixed. In the early stages this expectorate may be bright red, but after the blood leaves the vessel it loses its oxygen and becomes a dark, rusty color. It is a very common symptom of lobar pneumonia and tuberculosis. If this rusty sputa is very dark and profuse it is called prune juice sputa, being found in the same diseases.

Yellow or green sputum is nearly always purulent, being composed of pus, and indicates abscess or suppurative inflam-

mation of the lungs. It has an offensive odor and consists of destroyed lung tissue and pus.

Hemoptysis is the expectoration of a considerable quantity of pure blood, and indicates a hemorrhage of a pulmonary or bronchial vessel. This is a common occurrence in tuberculosis where there is an erosion of the blood vessel walls; but also occurs in perforation of the lung, abscess, gangrene and cancer. It is necessary to distinguish between hemoptysis and hematemesis. The former is usually accompanied by a cough, upon which the mouth is filled with salty blood and spat out. The blood is of a bright red color, is neutral in reaction, and is usually frothy. Hematemesis is produced upon the act of vomiting. The blood is of a dark red color, because of having lost its oxygen and having been altered by the digestive fluids, and is acid in reaction because of being mixed with the gastric juice.

The Spinal Column

The spinal column is one of the most important parts of the body, and is the part to which the Chiropractor largely confines his examination. The spinal column is examined for curvatures, ankyloses, exostoses, subluxations, and other deformities.

A posterior curvature of the spine is called a **kyphosis**; a lateral curvature of the spine is called a **scoliosis**; and an anterior curvature of the spine is called a **lordosis**. The significance of spinal curvatures is too great to be considered here, but brief mention will be made as to disease conditions of which they are symptomatic.

Kyphosis is a prominent symptom of asthma and emphysema, but the most common condition indicated by kyphosis is Pott's disease. Pott's disease is tuberculosis of the bodies of the vertebræ. The tubercular inflammation causes the bodies to become soft and the weight of the trunk causes the anterior part of the body to become thin, thus making the vertebra become wedge shaped. Such a condi-

tion, involving several vertebræ, will give rise to an acute kyphosis. In every case of acute kyphosis Pott's disease should be suspected.

Scoliosis is a common symptom in chronic interstitial pneumonia and chronic tuberculosis, where the condition involves but one lung. In such a condition the concavity of the scoliosis is toward the affected side, thus permitting greater and increased expansion of the unaffected side. In such conditions the scoliosis is adaptative, and any adjustment that may be given should be given for the purpose of restoring normal function to the internal viscus, or to the affected viscus, to which the curvature is adaptative.

Lordosis is always adaptative, and in diseases of the spine it is always adaptative to a kyphosis. It is commonly found in the lumbar region in case of pregnancy, ascites, or large abdominal tumors, but may also occur when the spinal muscles are weakened from paralysis and unable to maintain the body in an erect position.

Ankylosis of the vertebræ is a growing together or uniting of the articulations, which may be brought about by a softening of the bone, so that two bones may become fused, or it may be produced by a new growth of bone upon one or both the vertebræ, causing their union. Ankylosis of the spine can easily be determined by having the patient sit in an erect position and by placing the three palpating fingers between the spinous processes in the region of the spine in which the ankylosis is suspected; then by having the patient bend forward and backward it can be determined whether or not there is movement. If movement exists there is no ankylosis, but if no movement can be detected the stiffness of the spine may be due to ankylosis. A spinograph, or X-ray picture of the spine, should be made to accurately determine the condition.

Exostosis is an abnormal or excessive growth of bone upon the surface of bone, or in their cavities. Exostoses sometimes form upon the spinous processes of the vertebræ

and interfere with vertebral palpation. This can only be overcome by resorting to the spinograph. False exostoses are usually found on the bodies of the vertebræ and play an important part in the formation of ankyloses.

A vertebral subluxation is a partial displacement of the vertebra, and is determined by vertebral palpation. A subluxated vertebra prevents normal movement of the spine and causes impingement upon the spinal nerves at the intervertebral foramen, thus interfering with the transmission of brain energy to the tissue. With mental impulses being diminished in an organ there will be abnormal function in that organ, thereby making the organ weak, unable to perform its work, and susceptible to disease.

SECTION III

**PHYSICAL EXAMINATION OF THE
CIRCULATORY SYSTEM**

The Heart

The heart is a muscular organ situated in the mediastinum behind the sternum and between the right and left lung. The heart is divided into four cavities. The uppermost cavities are named auricles, while the lowermost cavities are named ventricles. The septum dividing the right side of the heart from the left side of the heart has no openings, but the septum dividing the auricles from the ventricles has an opening on each side. The opening between the left auricle and left ventricle is known as the left auriculoventricular opening. This opening is guarded by the bicuspid or mitral valve. The opening through the septum separating the right auricle and the right ventricle is called the right auriculoventricular opening and is guarded by the tricuspid valve. The left auricle has openings in its wall for the return of the blood from the lungs through the four pulmonary veins. The right auricle receives blood from the superior and inferior vena cava. The left ventricle has one large opening in its wall known as the aortic opening through which the blood is pumped on its way through the systemic circulation. The right ventricle also has one large opening called the pulmonary opening through which the blood is pumped on its way to the lungs. The aortic opening is guarded by a valve having three segments and called the aortic or left semilunar valve. The pulmonary opening is likewise guarded by a valve having three segments and called the pulmonary or right semilunar valve.

Position of the Heart

The Upper Border. The upper border of the heart is on a level with the upper border of the third costal cartilages, extending from a point one-half inch to the right of the sternum to a point one inch to the left of the sternum.

The Right Border. The right border of the heart is described by a curved line, the convexity of which extends toward the right, extending from a point one-half inch to the right of the sternum on the upper border of the third rib, to the junction of the sternum with the sixth costal cartilage.

The Left Border. The left border of the heart is described by a slightly curved line, the convexity of which projects leftward, from the upper border of the third rib, one inch to the left of the sternum, to the upper border of the sixth rib, one inch internal of the mammillary line.

The Inferior Border. The inferior border of the heart extends from the junction of the sternum with the sixth right costal cartilage to the upper border of the sixth left rib one-half inch internal of the mammillary line.

Mobility of the Heart

The heart is suspended in the pericardium by the roots of its great vessels, its base is fixed and is only displaced when the heart is subjected to unusual degrees of pressure. The apex of the heart, which is free, is capable of considerable alteration in position. When lying upon the left side the apex of the heart will move from one to two inches toward the left from its normal position. When lying upon the right side the apex moves toward the sternum as much as one inch. During a deep inspiration the apex of the heart moves downward with the diaphragm as much as two inches. When lying upon the back the apex beat may be imperceptible and the heart sounds become difficult to hear because of the recession from the chest wall. Upon leaning forward the apex beat is increased in force and the heart sounds are more clearly audible.

The Cardiac Cycle

The heart being a muscular organ its function consists of a series of rhythmic contractions propelling the blood to all parts of the body. It is necessary for every organ of the human body to enjoy periods of rest. Even though the heart is considered to be constantly working, yet it has short rest periods. The two auricles work simultaneously. Their period of contraction lasts but one-tenth of a second, they then resting seven-tenths of a second before again acting. The contraction of the auricles is immediately followed by the contraction of the ventricles which lasts three-tenths of a second. The ventricles then rest five-tenths of a second. A cardiac cycle consists of one complete act of the heart. When the pulse rate is 75 each cardiac cycle occupies eight-tenths of a second. During this eight-tenths of a second the auricles work one-tenth and rest seven-tenths; the ventricles work three-tenths and rest five-tenths. For convenience in diagnosis the cardiac cycle is described as follows:

Auricular systole one-tenth of a second; ventricular systole three-tenths of a second; ventricular diastole four-tenths of a second. It will be seen that the auricle is resting during the time that the ventricle is contracting, and also the first four-tenths of a second that the ventricle rests, and the ventricle rests in addition to this four-tenths of a second, the one-tenth second that the auricle works.

Normal Heart Sounds

Normally there are two heart sounds. The first sound begins with the systole of the ventricles. It results from a series of vibrations arising from closure of the mitral and tricuspid valves, the contraction of the ventricles and the movement of blood over the rough ventricle walls through the aortic and pulmonary openings. This sound has been named "Lubb." It is also called the muscular sound of the heart. This first sound lasts throughout the systole. It does

not have an abrupt end and is described as being low pitched. It is best heard at the apex of the heart.

After the first sound there is a brief moment of quietness followed by the second sound. The second sound of the heart is caused by closure of the aortic and pulmonary valves. It is more abrupt than the first sound and is somewhat high pitched. It has been named "Dupp." The second heart sound is best heard at the base of the heart.

Accentuation of Heart Sounds

Under normal conditions the first sound of the heart is accentuated at the apex or in the mitral and tricuspid areas. The reason for this being that it has its origin in the contraction of the ventricles. These vibrations are naturally more forceful and more clearly audible when we place the stethoscope directly over the seat of their origin.

The second sound of the heart is normally accentuated at the base or in the aortic and pulmonary areas. The reason for this is that the vibrations caused by the closure of the aortic and pulmonary valves are conducted by the aorta and pulmonary arteries to these areas. The normal heart sounds may be modified under a variety of circumstances. Violent exercise, emotion, stimulants and excessive eating increase the speed and force of the heart, causing all of its sounds to be intensified. Prolonged effort on the part of the right ventricle in chronic tuberculosis or fibroid pneumonia will cause its hypertrophy with a resulting accentuating of the first sound in the tricuspid area, and the second sound in the pulmonary area. In the same manner prolonged overexertion of the left ventricle in cases of arterial hypertension will cause abnormal accentuation of the first sound in the mitral area, and the second sound in the aortic area.

Methods of Examination

In addition to the case history which includes the subject of symptoms, four methods of physical diagnosis are employed

in examination of the heart. These methods are inspection, palpation, percussion and auscultation.

Inspection

Inspection is employed to detect the area of visible cardiac pulsation, epigastric pulsation and precordial bulging.

The Apex Beat

The wall of the left ventricle forms the apex of the heart which is spoken of as the anatomical apex. The wall of the right ventricle lies in contact with the anterior thoracic wall and with each systole its apex is pressed more firmly against the thoracic wall producing the so-called apex beat or cardiac impulse. For this reason the apex of the right ventricle is called the clinical apex. Normally the apex beat produces a visible pulsation over an area, the diameter of which is about one inch. This area is situated in the fifth intercostal space about one-half inch internal of the mammillary line. This visible impulse is more forcible when the heart is acting rapidly and forcibly. It is less extensive in the recumbent posture. The visible impulse may be absent when the clinical apex lies behind a rib, or where the chest wall is excessively thick, or where the heart muscle is extremely feeble. In cases of emphysema where the lung tissue is stretched, more of the heart is covered and a portion of the lung is interposed between the apex of the heart and the thoracic wall. This would serve to cause absence of the apex beat. In a similar manner an effusion into the pericardium serves to cause absence of the apex beat.

Displacement of Apex Beat

The apex beat may be displaced upward because of a high position of the diaphragm due to tympanities, ascites, abdominal growths or distention of the stomach. Occasionally

effusions into the pericardium not only cause the apex beat to be invisible, but also serve to displace the heart upward.

The apex beat may be displaced downward by the pressure of an aneurism in the arch of the aorta or by mediastinal tumor. Likewise general prolapses of the abdominal viscera with a downward displacement of the diaphragm brings the apex below its normal position. Hypertrophy of the left ventricle displaces the apex beat downward and to the left.

The apex beat may be displaced to the left or right by unilateral emphysema tumor of a lung or pleura, an effusion of gas or fluid and by a change in posture.

The area and force of the apex beat may be increased by overactivity of the heart muscle, hypertrophy and dilatation of the heart, or by retraction of the left lung.

Epigastric Pulsation

Epigastric pulsation is a visible or a palpable pulsation in the epigastric region. It may be systolic or post-systolic in time. Its time is determined by placing one hand upon the pulsating epigastrium and the other hand on the apex beat of the heart. When the impulses in each region coincide, the pulsation is said to be systolic in time. Systolic epigastric pulsation is a direct result of a forceful or overactive heart. It is especially common in hypertrophy and dilatation of the right ventricle, and is also found when the apex beat is displaced to the right. Thus it has no unusual significance. Overactivity of the heart may be due to fever, valvular defects, toxic goitre, or anemia. Post-systolic epigastric pulsation is due to the expansion of the aorta. It is commonly seen in neurotic individuals and those suffering from gastric disorders. Upon deep abdominal palpation in those having thin abdominal walls the pulsating aorta is distinctly palpable. Neurotic patients discovering this often become concerned about the cause of the pulsation. Their mind is usually relieved when it is explained that this is merely the pulse in the aorta.

Precordial Bulging

Precordial bulging is most commonly encountered in children and women having thin flexible thoracic walls. The most common significance of precordial bulging is enlargement of the heart. The enlargement may be in the form of hypertrophy or dilatation, either of which is the result of prolonged overexertion. Men who have congenital heart lesions or defects produced early in life may also have precordial bulging. In the majority of instances precordial bulging due to enlargement of the heart lies between the third and seventh ribs, and between the left border of the sternum and the mammillary line. Immense hypertrophy of the right ventricle in children may cause a marked bulging of the entire sternum and the sternal ends of the ribs on both sides. In adults having a Cor Bovis the bulging may extend far beyond the mammillary line.

Effusions into the pericardium are usually temporary, yet cause temporary precordial bulging. As a rule the bulging is more pronounced in the intercostal spaces in these cases. The bulging from pleural effusions extend beyond the precordium and are more commonly lateral. These conditions are discoverable by inspection supplemented by palpation and percussion.

Precordial Retraction

Retraction in the precordial region during inspiration is indicative of pericardial adhesions or pleural adhesions near the apex of the heart. Retraction of the entire left side is commonly observed in atelectasis, fibroid pneumonia, fibroid phthisis and other conditions producing collapse of the left lung. In these cases, however, the retraction is not confined to the precordial area.

Palpation

Palpation is used in examination of the heart to detect thrills, to detect points of tenderness, to examine the condi-

tion of related organs, to locate specifically the apex beat, to observe the cardiac rhythm, to study the size of the heart, to detect extra cardiac pulsation, to examine the arteries and veins.

A thrill is a palpable vibration of cardiac origin. Thrills vary in intensity from the finest vibration, which is barely palpable, to forceful vibration of which the patient is continuously conscious. Pronounced thrills may be discoverable over a large area of the thorax, but all of them have a point of maximum intensity. These abnormal vibrations have their origin at the valves of the heart, and are conducted by the heart muscle and by the blood stream. It should be readily seen that the point of maximum intensity will be the valvular area corresponding to the valve at which the vibration has its origin. Thrills are described as being systolic and diastolic. Those occurring in mitral and tricuspid stenosis are described as being presystolic, that is, they occur at the end of the diastole, and immediately before the systole of the ventricles. Mitral thrills are discoverable at the apex beat and in the axillary line, and often anywhere between these two points. In mitral stenosis the thrill is presystolic in time, while in mitral incompetency the thrill is systolic in time. Thrills originating at the tricuspid valve are palpable along the right border of the lower fourth of the sternum. Aortic thrills are best detected between the second and third ribs at the right border of the sternum, and if the heart is acting forcefully these thrills may be transmitted throughout the entire length of the sternum. Thrills originating at the pulmonary valve are palpable at the second left intercostal space. Thrills have their origin at the same point and in the same manner as murmurs; but the murmur is what you hear—the thrill is what you feel.

It is common in most diseases to find superficial tenderness in the area overlying the affected organ. By careful palpation this tenderness is traceable to the intervertebral foramina. Tenderness at the intervertebral foramen indicates

nerve impingement, a condition resulting from minute disrelation or subluxation of an adjacent segment. The detection and location of this tenderness is of prime importance to the Chiropractor, because it leads him to the physical cause of the incoordination.

The normal condition of many organs is dependent upon, in part, normal heart action. The heart pumps blood to all parts of the body, carrying nutritive material in its serum, and oxygen in its cells. Both of these are necessary to normal nutrition. The venous blood carries toxic material and metabolic waste from the tissues. These poisons in turn are carried by the blood stream to the various excretory organs. Failure on the part of the heart to perform its work permits this waste matter to accumulate, or permits an excess amount of blood to accumulate in the veins of the organs. This results in a condition of venous stasis characterized by swelling and enlargement. Such swelling and enlargement is plainly visible in the lower extremities during the period of lost compensation, or cardiac dilatation. Similar effects in the abdominal organs must be detected by palpation. In tricuspid disease drainage through the inferior vena cava is greatly resisted, resulting in edema of the abdominal organs as well as in the lower extremities. In such cases the liver is palpably enlarged and not uncommonly will it be found to pulsate. Similarly, pulsation may be detected in the jugular veins which in tricuspid stenosis will be observed to be presystolic in time. Systolic pulsation of the jugular veins suggests tricuspid incompetency of marked degree.

The visibility of the apex beat has previously been discussed. In many cases the apex beat is not visible, yet it is palpable. Its location is of considerable consequence in estimating the size of the heart. If we remember that the base of the heart remains stationary it can be readily seen that enlargement of the heart causes displacement of the apex beat. Therefore the length of the heart is the distance from the upper border of the third ribs to the apex beat. For

all practical purposes this is the easiest and simplest method of determining the approximate size of this important organ.

Extra cardiac pulsation is pulsation beyond the limits of the heart. Pulsation in the right supraclavicular space is found in aneurism of the innominate and the right carotid arteries. In marked hypertrophy of the left ventricle as well as in overaction of the heart resulting from fever, goitre, high blood pressure, or emotion, pulsations are palpable and frequently visible at the root of the neck. Aneurism of the arch of the aorta may cause pulsation in the upper intercostal spaces, especially to the right of the sternum, while dilatation of the abdominal aorta produces pulsation in the epigastric or umbilical regions. Systolic pulsation of the liver is suggestive of tricuspid incompetency. All of the diagnostic criteria thus gained through palpation should be carefully considered in connection with the symptoms and other physical findings before any definite conclusion is made.

The Pulse

During each systole of the ventricles three ounces of blood is pumped from the heart into the arterial system, which is already well filled. This increases the pressure within the arteries and causes them to expand with each contraction of the ventricle. This periodic expansion of the arteries is called the pulse. The arterial pulse indicates the frequency, regularity and force of the heart's action.

For convenience the radial artery is most commonly used to obtain clinical information regarding the pulse. In taking the pulse the patient should be in a sitting or recumbent posture, the forearm flexed and the hand semiprone. The first three fingers should be placed over the radial artery with the forefinger nearest the hand. In this examination of the pulse there are four important points to be determined, namely: size, rate, rhythm and force.

To determine the pulse rate the pulsations should be counted for fifteen seconds and multiplied by four to give the

rate per minute. When the pulse is very rapid and irregular it will be more accurate to count the pulsations for one full minute. When eight-tenths of a second is occupied by the cardiac cycle the pulse rate will be 75 per minute. This is given as the average normal pulse rate. As a rule the rate is slightly more rapid in women than in men and varies from 60 to 90 without any evidence of cardiac abnormality.

The pulse rate is by no means the all-important feature to be observed in pulse taking. The size of the pulse, its rhythm and force are equally important to cardiac efficiency. It is not extremely uncommon to encounter a pulse rate of 50 or 100 in which the cardiac muscle is efficient, yet a pulse of 75 of small size or poor rhythm may be encountered in a failing heart. The size, rhythm and force are more or less simultaneously noted. Observe whether the pulsations are large or small, regular or irregular in time, easily compressible or non-compressible. If the pulsations are small and irregular in time, and stop by light or moderate pressure the heart's contractions are weak. If the pulse waves are large, regular, and if the artery walls remain round and are palpable between the pulsations the heart is strong and forceful.

Intermittent pulse indicates inefficient systoles or absent systoles. In a failing heart muscle with pronounced mitral regurgitation it is common to note contraction on the part of the ventricles without the production of the pulse wave. In most cases of dilatation of the heart there is incomplete contraction which fails to produce a pulse wave. Occasionally intermittent pulse is observed in nervous individuals or during pregnancy which apparently has no significance. In the main, intermittent pulse suggests a weak heart muscle suffering from want of vital energy which is so essential to its normal performance.

Irregular pulse is one in which the time and force of the pulsations are unequal. An irregular pulse may or may not be intermittent. Its chief indication is a weak or failing heart muscle.

Pulsus magnus is a large pulse such as is encountered in hypertrophy of the heart from any cause.

Pulsus parvus is a small pulse. It is characteristic of aortic stenosis.

Pulsus tardus is also called the slow or tardy pulse. These terms relate to the rise and fall of the pulse wave, and not to the rate. This is the characteristic pulse of arteriosclerosis and old age.

Corrigan's pulse is also called the shot pulse and the water-hammer pulse. It is the characteristic pulse of aortic incompetency. The pulse wave has a rapid and pronounced rise, after which it suddenly falls from the finger. The sudden recession is caused by the sudden decline in the systolic pressure permitted by regurgitation into the left ventricle.

The dicrotic pulse. The normal pulse is faintly dicrotic. In fevers of high degree and of prolonged duration the second wave becomes markedly pronounced and may be palpable. When palpable, it occurs as a secondary tap immediately following the primary wave. It can only be detected upon very light pressure and with highly sensitive fingers.

Capillary pulse occurs in marked hypertrophy of the heart, especially when aortic regurgitation coexists. It is best detected by rendering the tip of the finger nail anemic with pressure on the tip of the nail and observing a rhythmical increase in the area of redness. It may also be detected by everting the lower lip and rendering a portion of the mucous membrane anemic with pressure by a piece of clear glass. It will be observed that the anemic area diminishes in size with each pulsation of the heart.

Percussion

Percussion is used in examination of the heart to determine its size and position. Inasmuch as a portion of the heart is covered by the lung, the percussion note is not of the same quality over its entire area. In percussing that area of the heart not covered by lung, the percussion note is dis-

tinctively dull. This area is known as the area of absolute dullness or the area of exposed dullness. The percussion note over the base of the heart and the lateral borders is modified by that portion of lung projecting between it and the thoracic wall. This area of modified dullness is known as the area of relative dullness or covered dullness.

For all clinical purposes percussion of the heart is of little value. The information obtainable by percussion is more easily obtained by palpation and inspection. When we remember that the base of the heart remains in constant position on a level with the upper border of the third rib, it is easy to determine the length of the heart by merely measuring the distance from the upper border of this third rib to the left border of the apex beat. The only exception to this occurs when the heart is displaced by growths or aneurism which crowd it from its normal suspended position. When percussion of the heart is used its greatest value lies in determining the condition of that portion of the lung overlying the heart and in detecting effusions into the pericardium and pleura.

Technique of Percussion

There are two methods of percussion used in determining the area of cardiac dullness, ordinary or flat-fingered percussion and threshold percussion. Neither of these methods are absolutely accurate, due to the fact that the surface of the heart does not lie parallel to the surface of the thorax, and further, because the vibrations pass through tissues that vary in density. In using flat-fingered percussion it is necessary that the fingers be placed upon the thorax so that they lie flatly or in conformity with the curve of the thorax. In doing this it will be readily seen that when the hand moves laterally from the heart we will still be percussing toward it, and by using a heavy percussion stroke it would be possible to obtain modified resonance far beyond the actual limit of the heart.

In ortho-percussion the middle finger is flexed at the second joint. The tip of this finger is placed upon the thoracic wall and acts as the pleximeter. This finger should at all times be held perpendicular to an imaginary plane extending through the axillary line. The purpose of this position is to avoid securing relative dullness when the finger is placed beyond the cardiac border. The opposite middle finger is used as the percusser. The percussion stroke must be gentle but snappy, and done in quiet surroundings.

It is preferable to percuss from lung to heart, as it is easier to distinguish between the normal clear pulmonary resonance and the modified resonance, and between the modified resonance and the absolute dullness of the exposed heart area. To locate the upper border of the heart, begin at the second rib and percuss downward until the area of dullness is reached, at which point the skin may be marked with a skin pencil. To locate the lateral borders of the heart, begin sufficiently far to the right or left that at first pulmonary resonance will be secured. Percuss inward towards the area of the heart at different levels until dullness is ascertained. At each level where dullness is ascertained mark with a skin pencil. After this procedure is complete these marks may be united and will indicate the area of dullness. Inferiorly cardiac dullness and hepatic dullness will be continuous, therefore percussion is of no value in determining the exact lower border of the heart.

Auscultation

Auscultation is used in examination of the heart in determining the condition of the heart muscle, the condition of its valves, increase or decrease of arterial tension, the condition of the lung resulting from cardiac defects, and to some extent the condition of the blood and the membranes around the heart.

It is highly important that the student become familiar with the normal heart sounds and their variations before mak-

ing any attempt to determine abnormal heart sounds. It is likewise important for him to have a thorough understanding of the structure and action of the normal heart. In auscultation of the heart we should always listen for the normal heart sounds rather than for a suspected abnormal sound.

The first sound of the heart is produced by the contraction of the ventricles and the closure of the auriculoventricular valves. The vibrations arising from these causes are conducted by the heart muscle to the thoracic wall, at which point they are readily audible. The first sound is systolic in time. It occurs with the apex beat and with the rise of the carotid pulse wave. The first sound of the heart is normally accentuated at the apex. The vibrations constituting this sound arise in the walls of the ventricles, therefore will be more clearly audible when we listen over the ventricle wall. In auscultation of the heart if we place the stethoscope at any point directly overlying the wall of the right ventricle or the apex of the left ventricle we will be nearer the source of production of the vibrations that make the first sound than the source of the second sound.

The second sound of the heart is caused by closure of the aortic and pulmonary valves. It occurs immediately following the systole of the ventricles. It is normally accentuated at the base of the heart or over the aorta and pulmonary arteries. The vibrations arising from the closure of these valves are conducted by the aorta and pulmonary artery. These arteries lie nearer the thorax at the second intercostal space on each side of the sternum, hence the accentuation of the second sound at these two points.

The Valvular Areas .

The valvular areas are also called the auscultation areas. They are the points upon the anterior thoracic wall at which the heart sounds are most clearly audible. The valves of the heart lie sufficiently close to one another that a silver dollar placed near the middle of the sternum would overlies all of

them. Auscultation at this point would give us a confusion of sounds of little value. Vibrations originating at the valves of the heart are transmitted by the blood and by the heart muscle, consequently the valvular areas are located at points as remote from the origin of the vibration as it is possible to clearly hear them. In the valvular areas valvular sounds are clear and can be studied without the interference of co-existing and unrelated sounds.

The mitral area is located at the apex beat of the heart. Normally this is in the fifth intercostal space one-half inch internal of the mammillary line.

The aortic area is located at the second right intercostal space near the margin of the sternum. In some cases aortic sounds are more clearly heard at the fourth left costal cartilage.

The tricuspid area is located between the fourth and sixth ribs along the right border of the sternum directly over the wall of the right ventricle.

The pulmonary area is located in the second left intercostal space near the margin of the sternum.

Murmurs

A murmur is an abnormal heart sound. They are classified as being frictional or pericardial, functional or hemic, and organic or valvular.

A **frictional or pericardial murmur** is a friction sound of a rasping or scraping character, due to the friction of inflamed pericardial surfaces. These sounds are always localized and not transmitted. They are as a rule most clearly heard during expiration when maintained for a few moments. They can be intensified by firm pressure upon the stethoscope. They are most commonly heard between the second and fourth ribs along the left side of the sternum. They may change from day to day because inflammation may spread and the character of the exudate change, altering their tone and intensity. It is often necessary to have the patient lean forward in

order to detect their existence. They are usually systolic in time, but occasionally they are double and produce a scratching sound similar to that produced by pulling apart two pieces of adhesive tape. They are not accompanied by disturbances in the circulation nor by the signs of hypertrophy or dilatation of the heart.

Functional or hemic murmurs occur in anemia and chlorosis. It is believed their origin is due to changes in the consistency of the blood, together with a lowered blood pressure. When the blood from the ventricles enters the aorta and pulmonary arteries, having a low tension, it is thrown into whirls causing vibrations that constitute this murmur. They are always systolic in time and of a low, soft, blowing pitch. They are best heard at the pulmonary area, especially in subjects under 30 years of age. Functional murmurs are not transmitted in any direction, nor is there any palpable thrill. Except in long standing cases there are no signs of cardiac enlargement, these murmurs are transient and are not present with every systole. They are always associated with anemia and disappear with recovery.

Organic or valvular murmurs are abnormal sounds of the heart due to defects at the valves or the orifices they guard. These murmurs arise from two conditions, stenosis or obstruction of the orifice, or incompetency of the valve which permits regurgitation. The tone of the murmur depends upon the consistency of the blood, the force of the contraction of the heart, the physical state of the tissue set in vibration and other factors, a knowledge of which cannot be gained through auscultation. The more forceful the contraction of the heart, the more forceful will be the vibrations set up during its contraction. It may be generally said that a loud murmur suggests a strong heart and a favorable prognosis, while a faint murmur suggests a weak heart and a cautious prognosis. Inasmuch as the tone of a murmur depends upon the physical state of the vibrating tissue and the force of the heart's contraction which sets it in vibration, it is impossible to deter-

mine the nature of valvular defects by the tone produced. The following terms suggest varying tones that may be encountered: Soft, low pitched, sharp, shrill, high pitched, blowing, sighing, cooing, gurgling, whistling, hissing, sawing, grating, musical, squeaking, blubbering, roaring, and rumbling. It cannot be said that any one or combination of these qualities suggests either incompetency or stenosis. For this purpose murmurs are classified as systolic and diastolic.

Systolic murmur is an abnormal heart sound which occurs during the systole of the ventricle.

Occurs with the apex beat.

Occurs with first sound of the heart.

Occurs with rise in pulse wave.

Diastolic murmur is an abnormal heart sound which occurs during the diastole of the ventricles.

Occurs between apex beats.

Occurs after the first sound.

Occurs with the fall of the carotid pulse wave.

Presystolic murmur is one which occurs during the last part of the diastole and immediately before the systole of the ventricles. Presystolic murmurs are found in mitral and tricuspid stenosis only. In these two diseases auricular fibrillation usually arises and tends to increase the intra-auricular pressure and is responsible for these murmurs becoming diastolic. It is less confusing to disregard presystolic murmurs as such, and consider all organic murmurs as being systolic or diastolic in time. Organic murmurs of the heart may accompany, modify, or completely replace the normal heart sounds.

Detecting the Murmur

Auscultation of the heart should be made with the patient in the erect posture and in the recumbent posture, and frequently it is advisable to have the patient exercise for a few minutes in order to clarify the significance of feeble abnormal sounds. It should always be kept in mind that in

auscultation of the heart we look for the normal heart sounds, Lubb-Dupp. No conclusion should be reached before all facts are ascertained, and if this be kept in mind the examiner will be less likely to look for suspected sounds.

All murmurs are heard loudest at one point—the point of maximum intensity. This point is usually the valvular area corresponding to the defective valve. Most murmurs can be heard in some one direction leading from the point of maximum intensity. This direction depends upon the conductivity of the structures to which the vibrations are transmitted. The walls of the heart, the sternum and the great vessels are good conductors. It is for this reason that the murmur of aortic incompetency may be heard along the entire sternum and the murmur of aortic stenosis transmitted to the root of the neck by the aorta.

With the patient breathing quietly each of the valvular areas should be examined carefully and thoughtfully. At each area listen for the normal sounds, Lubb-Dupp. Begin at the mitral area, then the aortic, then the tricuspid and lastly the pulmonary. If a systolic murmur exists it may modify, totally replace, or accompany the first sound, hence the necessity for familiarity with the variations of the first sound. When the first sound is so obscure that the murmur cannot be properly timed by its occurrence, the fingers of the free hand can be placed at the apex beat or upon the carotid pulse. If the murmur occurs with the beat or with the rise of the carotid pulse wave it is systolic in time. If the murmur occurs after the first sound or between the apex beats, or with the fall in the carotid pulse wave it is diastolic in time. The stethoscope should be moved in all directions from the point at which the murmur was first discovered until the point of maximum intensity is discovered. After the point of maximum intensity has been discovered and the time of the murmur ascertained we are ready to determine its significance or the valvular defect. This is done by calling to mind the physiology of the heart.

Assuming we have discovered a systolic murmur in the aortic area, and remembering that during systole the mitral and tricuspid valves are closed, and that the blood is passing from the ventricles into the aorta and pulmonary arteries, it can be readily seen that obstruction at the aortic orifice is the only defect that would cause such a murmur.

Mitral Murmurs

Mitral murmurs may be systolic or diastolic. The latter are commonly referred to as presystolic. A systolic murmur in the mitral area is usually loudest at the apex beat, and may be transmitted to the left axilla between the fourth and eighth ribs. If accompanied by displacement of the apex beat toward the left or associated with other signs of hypertrophy or dilatation it indicates mitral regurgitation. During the systole of the ventricles the normal mitral valve would be closed, and allowing that all other valves are normal nothing would be heard other than this sound of the heart. The only organic defect that would permit a murmur arising at this orifice during the systole would be mitral incompetency. Systolic murmurs in the mitral area are usually soft and low pitched, but this tone depends upon the state and texture of the tissues set in vibration by the regurgitating blood. Loud murmurs are associated with a thrill or palpable vibration which can be best detected at the point of maximum intensity of the murmur.

Diastolic mitral murmurs are best heard at the apex beat. They are usually localized within a narrow radius. They are usually sharp, shrill and high pitched. They are caused by the contraction of the left auricle forcing blood through the narrow mitral orifice. When the obstruction is pronounced the left auricle undergoes a series of minor contractions preceding its definite systole. These contractions increase the intra-auricular pressure and cause the murmur to be audible throughout a considerable part of the diastolic period. When this murmur is faint it is advisable for the patient to exercise

briskly a few moments, and then immediately examine him while lying on the left side. This procedure will bring out and make more distinct mitral diastolic murmurs.

Aortic Murmurs

Aortic murmurs may be systolic or diastolic. A systolic murmur indicates aortic stenosis. The vibrations arise at the aortic valve during the systole of the left ventricle. These vibrations are carried by the blood stream throughout the upper aorta and its branches. The murmur is localized at the aortic area, but may be transmitted upward to the carotids. It coincides with the first sound of the heart and frequently replaces it. If the valve segments are stiff and fail to properly close there will be no second sound. The absence of the second sound is further due to the fact that the arterial tension is low. Systolic murmurs in the upper part of the thorax, including the aortic area, may also be produced by aneurism of the aorta, growths pressing upon it, and a roughening or thickening of the tunica intima, therefore before concluding that a systolic murmur in this area indicates aortic stenosis it should be further substantiated by signs of hypertrophy or dilatation of the left ventricle.

A diastolic murmur in the aortic area indicates aortic incompetency. It begins with the second sound, and frequently replaces it. The point of maximum intensity may be the second right intercostal space or in the vicinity of the fourth rib to the left of the sternum. This murmur is transmitted throughout the entire length of the sternum, and frequently over the entire exposed cardiac area. Aortic incompetency is always associated with hypertrophy or dilatation, has Corrigan's pulse and a high pulse pressure. The large aortic pulse causes the aorta at the apex of the pulse wave to press upon the sternum. Bone being a good conductor of vibration causes these vibrations to be carried along the sternum and the sternal end of the ribs. In cases having marked hypertrophy of the left ventricle the murmur is audible over a

larger area. It is then necessary to note with care the point of maximum intensity in order to localize its source. It is possible to have aortic regurgitation without any murmur, and blood pressure affords the best method of detecting the condition when such is the case. It is not extremely uncommon to find systolic pressure 150 and diastolic pressure of 50, or even as low as 10 in such cases.

Tricuspid Murmurs

Tricuspid murmurs may be systolic or diastolic, the latter also being known as presystolic. A systolic murmur in the tricuspid area indicates tricuspid regurgitation. The point of maximum intensity is along the right border of the lower portion of the sternum. It may be transmitted somewhat to the right, and also upward along that part of the sternum overlying the wall of the right ventricle. It is sometimes the result of endocarditis, which has deformed the valve segments, but is more often a result of right ventricular dilatation. When this murmur is present the liver is apt to be enlarged and will pulsate with the heart. The jugular veins are also distended and jugular pulsation is frequently noted.

A diastolic murmur in the tricuspid area indicates tricuspid stenosis. The murmur is more often sharp, shrill and high pitched. It is best heard along the right border of the ensiform cartilage and is not transmitted. The tone and pitch of the murmur may vary, and are not important factors in determining the valvular defects.

Pulmonary Murmurs

Pulmonary murmurs may be systolic and diastolic in time. A systolic murmur in the pulmonary area indicates pulmonary stenosis which may be congenital or acquired. Pulmonary stenosis is the most common congenital valvular defect of the heart. When the condition is presentable the murmur is diffuse over a large area along the left border of the sternum.

It is associated with cyanosis and clubbing of the fingers. Congenital pulmonary stenosis may be associated with a patent foramen ovale or ductus arteriosus. In such an event there is a confusion of sounds, but standing out clear and above all others is the systolic pulmonary murmur. It is very rare that pulmonary stenosis results from endocarditis, but it is sometimes acquired by shrinking of the left lung following pneumonia, which causes a traction and narrowing of the pulmonary artery. Hemic murmurs are usually heard in this pulmonary area and are systolic in time, but they are usually transient and disappear as the anemia improves.

Diastolic murmur in the pulmonary area indicates pulmonary regurgitation. This murmur is said to be rare. It is best heard in the pulmonary area and may be transmitted along the left border of the sternum toward the superior a short distance.

Combined Murmurs

It is possible for two or more valvular defects to coexist. In such an event there may be two or more murmurs. A valvular orifice may be obstructed and at the same time its valvular segments rendered incompetent, or two separate valves may be defective. In the button-hole mitral valve stenosis and incompetency exist, giving rise to a systolic and a presystolic murmur; likewise the aortic valve may become stiffened and roughened so that it presents obstruction and permits regurgitation. With such a deformity at the aortic valve it would be possible to hear a systolic and a diastolic murmur which may completely obscure both normal heart sounds in the aortic area. The most common combined valvular defect is aortic stenosis and mitral regurgitation, in which there would be a systolic murmur in the aortic area and a systolic murmur at the apex beat.

In aortic stenosis and regurgitation and mitral regurgitation there would be a systolic murmur in the aortic area and in the mitral area, and also a diastolic murmur in the

aortic area. The detection of organic valvular defects depends upon locating and timing the murmurs and detecting symptoms and physical signs of enlargement of the heart.

Compensation

Valvular defects interfere with the circulation of blood. In order to maintain circulation as near normal as possible, under such circumstances, the heart muscle undergoes an adaptative hypertrophy to meet the increased work thrown upon it. In this hypertrophy the cavities are enlarged and the heart wall surrounding them is thickened, so that each systole of the heart forces the normal three ounces of blood into the circulation plus an amount equal to that which regurgitates. This is known as compensation. As long as the increased strength of this thickened muscle serves to maintain a normal circulation there will be no marked symptoms. In other words hypertrophy compensates for the valvular defects. If, however, the heart muscle should fail under this overwork the muscle fibers will stretch and the heart dilate. Compensation is then ruptured or broken. Broken compensation is equivalent to dilatation of the heart. The three cardinal symptoms of a failing heart are fatigue upon slight exertion, breathlessness and pain. In addition to these symptoms there may be vertigo, tinnitus, cyanosis, coldness, numbness and edema of the lower extremities. This edema is called cardiac edema. It is the result of the inability of the heart muscle to put sufficient force behind the circulation to return the blood through the veins against the resistance offered by gravity.

The duration of compensation depends upon the enervation of the heart muscle as well as to the strain under which the heart is placed. Vertebral subluxations that impinge nerves supplying the heart tend to shorten the duration of compensation or even prevent it developing. The first results obtained by chiropractic adjustments are due to a restoration of compensation resulting from freeing the impinged nerves

supplying the heart muscle. With compensation a heart having defective valves may serve its owner many years, a fact which explains the longevity of many people carrying valvular defects. The ability of the heart to perform its work is more important than the presence or absence of valvular defects, therefore too much stress should not be placed upon murmurs and greater importance should be attached to the condition of the heart muscle. The size, rate and rhythm of the pulse, blood pressure, indurance and other symptoms serve to give us information by which we are able to judge heart strength.

A cardiac case should not be looked at in terms of the valves as is so commonly done, but in terms of the heart muscle. Weakness of the heart is due to disease of this muscle. Exhaustion of the muscle acts as a cause of failure and may be brought about by the overwork of the muscle resulting from damaged valves. In early cardiac failure there may be no symptoms at rest. The patient's exercise tolerance will be reduced in proportion to the degree of failure present. The important thing to know is the amount of work which may be undertaken to produce distress. No patient who has a normal exercise tolerance has grave heart disease. Exercise tolerance varies with different individuals: those leading active lives have a better tolerance than those leading sedentary lives. Tolerance to effort can usually be judged from the patient's history. Is distress produced by walking on the level, climbing one flight of stairs, walking up hill? If in doubt any simple exercise such as hopping, lifting dumb bells, or running in space may be used. The exercise tolerance may be said to be reduced if there is undue breathlessness, exhaustion or pain incurred as a result of effort. To prevent misunderstanding it may be stated that pain in the cardiac region may vary from a feeling of substernal pressure to the most agonizing distress. Some patients having chronic heart disease have little or no pain; on the other hand pain is not uncommon in the cardiac region in individuals who present no

signs of heart disease. In this latter type the individual is generally young, highly strung and frequently the subject of a neurosis.

Important Points

Cardiac failure is the condition in which the heart is unable to maintain an efficient circulation when called upon to meet efforts necessary to the daily life of the individual.

The chief object in any cardio-vascular examination should be the determination of the presence or absence of cardiac failure.

Myocardial disease is the cause of cardiac failure in the majority of cases.

The early evidences of an impaired circulation are to be determined from the patient and these are the symptoms of distress produced by exertion. The chief symptoms are fatigue, breathlessness and pain.

The response to effort is the sole guide in the detection of the early signs of cardiac failure.

The two main types of cardiac failure are:

1. Cardiac failure of the congestive type.
2. Cardiac failure of the anginal type.

The chief early signs and symptoms of cardiac failure of the congestive type are:

Breathlessness upon exertion, engorgement of the veins of the neck and enlargement of the liver.

The chief and sometimes the only feature of cardiac failure of the anginal type is pain.

Cardiac pain in chronic heart disease is evidence of myocarditis. This is a symptom and not a disease.

The most common underlying pathological lesions found in anginal failure are:

1. Coronary artery sclerosis.
2. Aortitis (particularly syphilitic).
3. Coronary artery thrombosis.

Anginal failure is of serious prognostic significance, as sudden death is not uncommon.

All failures of the circulation are not necessarily heart failures. Circulatory failure in the infectious disease may be caused by a stagnation of blood in the systemic veins and capillaries.

"Symptoms in cardio-vascular affections are of more importance than physical signs in forming a prognosis. The question is, What is the heart capable of doing under conditions of rest and exercise? rather than what sort of noises it produces." (Sutherland.)

SECTION 4

BLOOD PRESSURE

Blood pressure is produced, chiefly, by two forces which exist and are active in the vascular system. They are known as propelling and resisting forces. The normal heart contracts about 75 times per minute and at each contraction forces about 3 ounces of blood into the arterial system, which is already well filled with blood. This increases the pressure of the blood upon the arterial walls and induces their stretching, known as the pulse. The intermittent contractions of the heart intermittently raises the pressure within the arteries and is therefore the **propelling force**.

One force acting independently of all others cannot produce pressure. To have pressure there must be a meeting of two opposing forces. This we have in the circulatory system. The arteries diminish in diameter as they lead from the heart. Their walls are elastic and at all times they are well filled with blood. When an additional 3 ounces of blood is forced into these arteries by the heart these elastic, muscular arterial walls offer resistance. Therefore the **resisting force** is that offered by the arteries.

Blood pressure, therefore, is produced by the heart pumping blood in the tapering elastic arteries, whose walls offer resistance. We measure this mutual pressure of blood upon artery and artery upon blood. Because the flow of blood from the heart is intermittent the pressure alternately increases and decreases. The rise in the pressure is with the contraction of the ventricles of the heart and is therefore called the—

Systolic Pressure

The systolic pressure is the highest pressure which exists in the arterial system during the contraction of the ventricles. It indicates gross heart strength. It is a measure of the **propelling force** in the circulation.

Diastolic Pressure

The rest period of the ventricles is called the diastole. Because no additional blood is coming into the arteries at this period, and because that blood which is already in the arteries is moving onward to the great capillary deltas, the pressure decreases. The **diastolic pressure** is the least pressure existing in the arteries during the diastole or rest period of the ventricles. It is a measure of the **resisting force** in the circulation. It denotes the elasticity or stiffness of the artery walls.

Pulse Pressure

The pulse pressure is the difference between the systolic and diastolic pressures. It is obtained by subtracting the diastolic pressure (expressed in millimeters) from the systolic pressure (similarly expressed). The pulse pressure indicates the reserve heart strength. It is a measure of the net heart strength over and above that required to overcome the arterial resistance.

Normal Pressures

Fought's formula for approximate normal male systolic pressure is: Up to the age of 20 add 100 to the age. After twenty add one millimeter for every two years the individual is over twenty. In women the systolic pressure is usually ten millimeters lower than in men.

Normal systolic pressures vary from 110 to 140.

Normal diastolic pressures vary from 70 to 100.

Normal pulse pressures vary from 35 to 50.

These variations in health depend upon age and sex of patient, while abnormal pressures indicate abnormal physical or physiological conditions in the body.

Physiological Causes of Rise in Blood Pressure

There are four things which increase the systolic pressure in a natural way. They are **exercise, emotions, stimulants, and food**. Some articles ingested, such as coffee, are always stimulative and all food has a stimulative effect when eaten by one who is starving. It is but natural for all people to exercise and all humanity is more or less emotional. These conditions increase the blood pressure by increasing the rate of the heart or slightly increasing the tension of the arteries. Their effect is temporary; therefore an increase of blood pressure is not indicative of abnormality unless it is persistent.

Pathological Causes of Rise in Blood Pressure

True high blood pressure is persistent; it does not vary greatly from day to day nor at different times in the day. It is brought about in two main ways, viz.:

1. Sclerosis of the arteries.
2. Hypertension of the arteries.

Sclerosis of the Arteries

Arterial sclerosis may be brought about by calcification or by fibrosis. In **calcification** there is a deposit of mineral elements in the arterial walls. This makes them hard and reduces their elasticity, consequently increases their resistance, and correspondingly raises the blood pressure. The mineral elements of the body would not be apt to accumulate in the arterial walls unless there was an overly large amount of it present. Such is the case in the lithemic diseases, nephritis and some other intoxications. Elimination is the principal function at fault.

In fibrosis there is an overgrowth of the connective tissue elements in the arterial walls. This overgrowth is induced by the action of toxic substances upon the arterial walls and though the injury may be slight yet nature produces a proliferation of connective tissue for protection. This connective tissue reinforces the muscular walls of the arteries and reduces their elasticity, thereby raising the blood pressure. Elimination is again at fault. It is rare that the systolic pressure exceeds 170 in arteriosclerosis from either of the above mentioned causes.

Hypertension of Arteries

Hypertension means that the arterial walls are contracted or abnormally tense. Their lumens are smaller and more force is required to stretch them. This hypertension is induced by the action of toxic substances in the blood stream which irritate and injure the delicate nerve endings. Here we see elimination is again at fault. It is true, however, that pain, vasomotor spasms, brain pressure and a few other conditions also bring about an elevation of the blood pressure due to hypertension. It can be safely stated that the vast majority of cases having a persistent systolic pressure of 180 mm. or over have kidney trouble, which is its organic cause. It may be that no abnormal urinary findings exist; nevertheless the kidney is failing to eliminate all of the solids that it should.

High blood pressure due to hypertension will be commonly found in nephritis, diabetes mellitus, locomotor ataxia, lead poisoning, brain pressure from any cause, angina pectoris, severe pain, early toxic goitre, and impending uremia of pregnancy. The vast majority of all cases of high blood pressure is due to hypertension and most of these to kidney failure.

When the arterial resistance is increased by sclerosis or hypertension the heart, to meet the increased demands placed upon it, undergoes hypertrophy. Thus, when the resisting

force is increased the propelling force is adaptatively increased, raising both the systolic and diastolic pressures.

Low Blood Pressure

In order to decrease the blood pressure there must be a decrease in the resisting or in the propelling force or both, or a decrease in the amount of fluid circulating in the vessels. Low blood pressure will be found in cases of cardiac dilatation, myocarditis and fatty degeneration of the heart because these conditions weaken the heart muscle, the propelling force of the circulation. Low blood pressure is found in aneurism of the aorta, atonic arteries and degenerations of the vascular system because they decrease the resisting force in the circulation. Conditions such as hemorrhage, dysentery and effusions into the serous cavities and the cachexic diseases lower the blood pressure because they decrease the amount of circulating fluid. Low blood pressure produces suboxidation, asthenia and syncope.

Significance of Variations in Blood Pressure

An increase in the systolic pressure with the diastolic pressure remaining at the normal level denotes increased activity on the part of the heart. This increased activity may occur with or follow exercise, emotions, stimulants, hearty eating or hypertrophy of the left ventricle. Increased activity of the heart muscle causes an increase in the volume of blood being propelled through the arterial system, but it does not increase the active resistance offered by the arteries; consequently it will be seen that an increase in the systolic pressure alone is the result of physiological causes.

High Systolic and Low Diastolic Pressure

An increase in the systolic pressure with a decided decrease in the diastolic pressure indicates aortic regurgitation.

Systolic pressure of 150 and diastolic pressure varying between 10 and 50 are common in this condition. The increased systolic pressure results from the adaptative hypertrophy of the left ventricle. The decline in the diastolic pressure is due to the incompetent aortic valve permitting blood to regurgitate into the left ventricle, thus reducing the arterial pressure during the rest period of the ventricle.

High Systolic and High Diastolic Pressure

Any decided increase in the systolic pressure accompanied by an increase in the diastolic pressure is commonly encountered in those numerous cases so well known by the title "high blood pressure." Primarily these changes in the pressure are due to increased peripheral resistance from arteriosclerosis or hypertension of the arteries. To meet this increased arterial resistance the heart is compelled to call into action its reserve strength, which, in the course of time, leads to its hypertrophy. As the peripheral resistance increases the diastolic pressure rises, and in proportion as the heart undergoes hypertrophy the systolic pressure increases. In arteriosclerosis the systolic pressure rarely exceeds 170. This is due to the fact that the process of hardening so well defined in the arteries is also occurring in the heart muscle. Degenerative changes of the heart muscle lessens the force of its action and therefore limits the height of the systolic blood pressure. In advanced cases of arteriosclerosis the systolic pressure recedes, making the pulse pressure very low. Low pulse pressure in arteriosclerosis indicates a failing heart, of either the anginal or congestive type, and will be characterized by fatigue, breathlessness and pain. In high blood pressure, due to hypertension, the systolic pressure may exceed 300 mm., while other cases may have hemorrhage with systolic pressures of 200. The ability of the arteries to withstand exceedingly high pressure depends upon the kind of material from which they are made.

Normal Systolic and High Diastolic Pressure

An increase in the diastolic pressure indicates arterial hypertension which would immediately call upon the heart for increased action. Increased action on the part of the heart would in turn raise the systolic pressure; consequently an increase in the diastolic pressure without a corresponding increase in the systolic pressure would indicate a failing heart muscle, and is commonly encountered in advanced arteriosclerosis. In all such cases there has been a time when the systolic pressure was above normal. Failure of the heart from dilatation or degeneration would not necessarily reduce the arterial tension, therefore would not affect the diastolic pressure.

High Pulse Pressure

High pulse pressure indicates a strong heart or a fast heart. It is found in hypertrophy of the heart, in the early stages of toxic goitre, moderate toxemias, but most common of all it is encountered in the Chiropractor's office at the first examination when the patient is nervous or emotional. The Chiropractor will do well to take the pressure on several occasions and when the patient is completely at home in his office before arriving at any definite conclusion because of increased pulse pressure.

Low Pulse Pressure

A low pulse pressure indicates weak heart muscle and is encountered in cardiac dilatation, chronic myocarditis and fatty degeneration of the heart. These cases have but little reserve strength. The heart and the body fatigues under slight exertion. It is generally accepted that pulse pressures below 34 or 35 are subnormal, yet it should be remembered that a pulse pressure of 28 or 30 may not produce symptoms indicating a weak heart. We should allow for slight variations below 35 and above 50 before considering the pulse pressure as being of pathological significance. Systolic pressures

below 100 in men and below 90 in women are considered abnormal, but a diastolic pressure correspondingly below normal may indicate nothing other than a very elastic artery wall.

Blood Pressure in Pregnancy

The determination of blood pressure in pregnancy is considered more important than the examination of the urine by many authorities. In cases of impending uremia the pressure will rise before albumen is found in the urine. Systematic observation of the blood pressure should be made once per month during the early part of pregnancy, and every week or two during the last two months. Any increase in the pressure should suggest more frequent and careful examination, while an increase in the systolic pressure to 150 indicates approaching uremia. Systolic pressure of 150 is a danger signal during pregnancy.

Blood Pressure in Pneumonia

Consolidation of the lung tends to flatten out the pulmonary capillaries, thereby offering resistance to the pulmonary circulation. Prolonged strain upon the wall of the right ventricle because of this consolidation leads to its dilatation and at the same time weakens the wall of the left ventricle. During pneumonia the pulse rate is rapid; as the heart weakens the pulse rate is increased. It may be said that so long as the systolic pressure expressed in millimeters exceeds the pulse rate there is no immediate danger of dilatation and consequent pulmonary edema, but when the systolic pressure falls below the pulse rate the prognosis is not favorable. It means the heart muscle is weakening under the heavy strain of pumping blood through the obstructed lung.

Extremely Low Pressures

The conditions giving the lowest readings are shock, collapse, internal hemorrhage and toxic paralysis of the vasomotor center. This latter condition is very common in diph-

theria. The lowest recorded reading of systolic pressure followed by recovery is 50 mm. However, systolic pressures below 100 in men and 90 in women should be regarded as pathologic.

The Relation of Blood Pressure to Life Insurance

In practice the primary purpose of blood pressure tests is for the purpose of differential diagnosis, but to the physical director of an insurance company blood pressure, if persistently abnormal, is evidence of present or impending degeneration. The physical director is concerned with the problem of selecting the good risks and rejecting the poor ones. Much depends upon his judgment, not only to the company but to the applicant. The blood pressure of the applicant is just one of the measurements used in classifying the risk to be assumed by the company in accepting an applicant. In order that these measurements may be reliable, it is highly essential that the information acted upon be accurate. Therefore great care should be observed in the technique of taking the blood pressure. The examiner has a great responsibility; he is one of many who are gathering data which cannot be obtained in any other way. The usefulness of the information the examiner furnishes is not only the basis for many decisions by the company, but to a large extent the standing of the company depends upon the accuracy of his findings. This thought should be an inspiration for the exercise of real diligence in making the examination and particularly in taking the blood pressure.

Technique of Measuring Blood Pressure

The two methods of taking blood pressure are known as the palpatory and auscultatory methods. The palpatory method is used when extreme accuracy is not essential, but inasmuch as its chief value lies in attaining the approximate systolic pressure it is of little scientific value. The auscultatory method is the only means of determining diastolic pres-

sure and is the method in general use today. This method involves the use of a sphygmomanometer and a stethoscope.

The two types of instruments for measuring blood pressure are known as the mercury type and the aneroid type. The author prefers the mercury type instrument and uses a Baumanometer. The mercury type instrument is scientifically correct if individually calibrated in millimeters. It should have a large legible scale which is easily read by the examiner.

The Bowles model stethoscope is most universally used because of its simplicity and flexibility in making examinations. In selecting a stethoscope the individual should test it for the transmission of sounds and fit it to his own head; the ear tips should be comfortable and should so fit that they exclude extraneous sounds, yet not so tight that its use would be unpleasant.

When to Take Blood Pressure

Inasmuch as exercise, eating and excitement raise blood pressure, it is preferable to measure blood pressure midway between meals and after a short rest. The normal increase of blood pressure following meals and light exercise is from 5 to 15 millimeters. More strenuous exercise and emotional excitement increase the pressure still more. There is a tendency toward a slight and gradual rise of 10 to 15 millimeters during the day. These facts are worthy of note and account for some variations observed when the pressure is taken at different times of the day.

For convenience the left arm is used in measuring blood pressure. The patient should be seated facing the examiner, the left arm should be barred to the shoulder, and careful attention should be given to avoid the clothing being rolled tightly upon the upper arm. The arm should rest on a desk or table in a state of relaxation. The patient should not stretch his arm, nor grip his fingers, nor sustain weight on the arm being examined.

The examiner should face the patient, sitting in a comfortable position, which permits him to observe the effect of the examination on the patient or correct a faulty position of the patient. The mercury type instrument should be placed on a level surface facing toward the examiner to insure proper results.

Placing the Cuff .

The cuff consists of a rubber bag with a cloth covering the arm band, which serves as a binding device. The center of the compression bag should be placed directly over the brachial artery on a level with the heart. Holding it in this position the sleeve band should be wrapped around the arm and the last two or three inches of the band tucked into the final fold of the wrapping. Care should be used to avoid wrapping so tightly that the tissue is compressed; likewise the band should not be wrapped so loosely that it will slip down to the elbow, as this also leads to pumping much air into the cushion which tends to deaden the sounds. Care should also be used to avoid the rubber tubing coming in contact with or crossing one another.

The stethoscope should be placed over the bifurcation of the brachial artery, at the crease of the elbow and below the cuff. Care should be exercised to avoid permitting the stethoscope to slip under the cuff, as this interferes with proper compression and gives rise to false readings.

Determining Systolic Pressure

After the cuff has been placed as described with the needle valve of the compression pump closed, apply pressure by means of the pump and with the left hand palpate the pulse. Continue to increase the pressure until the pulse disappears. Do not apply pressure of 200 millimeters when 150 is sufficient to shut off the radial pulse.

Apply the stethoscope over the brachial artery and release the pressure slowly by means of the needle valve. Listen

carefully for pulse sounds. The first sound is clear and snappy, but not necessarily loud. It is easily distinguished, as the beats or taps following are rhythmic and regular. The level of the mercury in the calibrated tube when the first regular beat is heard indicates the systolic pressure. Any occasional tap not followed by successive regular taps should be disregarded.

Determining the Diastolic Pressure

After ascertaining the systolic pressure continue to release the pressure by permitting air to slowly and gradually escape through the needle valve. As the mercury drops 10 to 20 millimeters it will be noted that the tone and volume of the sounds change. Shortly after they pass the point of maximum intensity they become more faint and disappear. The level of the mercury, when the last well defined tap occurs, indicates the diastolic pressure.

Synopsis of Auscultatory Method

The cuff should be applied, preferably to the left arm, on a level with the heart, the subject sitting and the arm resting on a table or desk. Place the stethoscope over the brachial artery just below the cuff, avoiding undue pressure. Inflate the sphygmomanometer bag until the heart sounds disappear; slowly release the air until the sound reappears. The first sharp, snappy sound is designated as the first phase and is the systolic pressure. Following the snappy sounds, there is a soft blowing murmur which covers a period of ten or more millimeters which is termed the second phase. This phase is not recorded in the reading. Following the murmur there is a return of the sharp, snappy sounds which is spoken of as the third phase. These are also disregarded in the reading. These sharp, snappy sounds or taps continue for a varying number of beats when they become abruptly muffled. This point of muffling is the fourth phase and is the diastolic

pressure. As still more air is released, the muffled sound disappears entirely, constituting the fifth phase, which is of no consequence whatever in taking the blood pressure.

Faught's Formula

The blood pressure may be roughly estimated by the use of Faught's Formula, namely: that a young man 20 years of age should have systolic pressure of 120 and diastolic pressure of 80. The systolic pressure will increase one millimeter every two years after the age of 20. The use of this formula will bring the blood pressure of people past 60 somewhat above the average normal, yet it is sufficiently accurate to be of value in general practice. The blood pressure in women as a rule is 10 millimeters less than in men.

The Effects of High Blood Pressure

Increased arterial tension throws added work upon the heart and results in its hypertrophy. The increased strength of the heart resulting from this hypertrophy then becomes a factor in maintaining the systolic pressure, consequently hypertrophy of the heart will exist to some extent in all cases of high blood pressure. This hypertrophy is adaptive and cannot be construed as an effect or danger.

The most common effect of high blood pressure is intracranial hemorrhage commonly known as apoplexy. The vessel ruptured is most frequently a terminal branch of the middle cerebral artery. For this reason the middle cerebral is known as the artery of cerebral hemorrhage. The terminal branches of the middle cerebral lie in the Sylvian fissure and their walls are not reinforced by tissue substance as most other arteries in the body. These arteries are also end arteries, having no anastomosis. These two facts are largely responsible for cerebral hemorrhage occurring more frequently than hemorrhage elsewhere. Persistent high blood pressure subjects these artery walls to great strain. Emotional excitement, stimulants, or exertion occurring suddenly

often raises the pressure beyond the ability of these artery walls retaining the blood.

Persistent high blood pressure also favors the production of aneurism at a point where the artery wall is weak, or partially obstructed by pressure. Those cases of high blood pressure due to arteriosclerosis are apt to develop thrombosis, or embolism.

Effects of Low Blood Pressure

The nutrition and strength of the body is dependent upon the oxidation of food in addition to trophic impulses. The presence of oxygen is essential in assimilation. In low blood pressure the velocity of the circulating blood is greatly reduced, consequently its oxygen carrying capacity is diminished. This results in suboxidation with resulting asthenia. All cases of low blood pressure fatigue on slight exertion, are breathless, and whenever the supply of oxygen reaching the brain is insufficient to maintain its function there is syncope.

Adjustments for High Blood Pressure

The vertebral subluxations which are capable of causing high blood pressure may be found in upper cervical region, liver place, kidney place and lumbar region. It should be remembered that both the liver and the kidney are enervated by nerves arising from the vicinity of the 9th dorsal. Both arteriosclerosis and hypertension are chiefly dependent upon improper elimination. Metabolic waste is produced in all tissues of the body. This waste is disintegrated by the spleen and in the blood stream. When it reaches the liver it is transformed into urates or prepared for proper elimination. These urates are turned back into the circulation which carries them to the kidneys. The kidney filters out these impurities called the urates by a process of secretion, forming the urine which is excreted by way of the bladder. Consequently, should the spleen fail to perform its part in

disintegrating the waste matter, or the liver fail in its work of transforming the waste matter into urates, or the kidneys fail to eliminate them, the result will be an autointoxication. It would not be necessary to have organic disease in these organs when they underfunction. The disordered function might result from impingement of secretory nerves alone, as all of these processes belong to that primary function. The retained poisons upon irritating the vasomotor nerves induce hypertension and by irritating the tunica intima, or by deposition in the tunica intima leads to sclerosis. Improper function of the bowels is likewise an important factor in the production of autointoxication. Fecal toxins also irritate vascular nerves and alter the tension of the vessels they supply.

Upper cervical subluxations may produce high blood pressure by involving the vasomotor center in the brain, or the vasomotor center in the anterior horn of the spinal cord. Young individuals of nervous temperament having high blood pressure and having no discoverable physical cause for the high pressure, frequently have upper cervical subluxations inducing the hypertension. These cases are greatly benefited by adjustments and rest, where they will be free from excitement and mental strain.

Adjustments for Low Blood Pressure

Low blood pressure being due to weakness of the heart muscle, anemia or lost tone in the artery walls will be caused by upper cervical, upper dorsal, liver, kidney or lumbar subluxations. The three latter regions may be productive of imperfect elimination. The retained poison acts upon the vital muscular tissue of the vascular system, causing its degeneration and consequent loss of tone. The upper cervical and upper dorsal subluxations may impinge nerves supplying the artery walls or the heart muscle, producing loss of tonicity and power of contraction. Low blood pressure as well as high blood pressure is merely a symptom and the adjustment must be directed to its cause.

SECTION V

EXAMINATION OF THE RESPIRATORY ORGANS

BY DR. H. E. VEDDER

The Thorax

The Sternum.—The sternum is approximately six inches long. It lies in the median line of the anterior thoracic wall affording attachment to the clavicles and the costal cartilages. The upper border is marked by a depression (the episternal notch) which lies at the level of the disc between the second and third dorsal vertebræ. This notch is normally two inches anterior to the disc. The lower terminus is marked by a depression (scrobiculus cordis) commonly called the pit of the stomach. This lower terminus lies at the level of the disc between the ninth and tenth dorsal vertebræ. At the junction between the manubrium and the gladiolus a transverse ridge is readily palpated. This is the angle of Louis (Ludovici) and marks the junction of the second costal cartilage with the lateral border. This is a convenient starting place in counting the ribs.

Ribs and Intercostal spaces.—There are twelve ribs and eleven intercostal spaces. The space is designated by the same number as the rib above it. The first rib in front is on the level of the fourth rib behind. The second to the seventh ribs in front are on the level of the sixth to the eleventh ribs respectively at the back. Thus by adding four to the rib palpated at the anterior we determine the number of the rib at that level at the posterior. At the posterior the tips of the spinous processes on the second to the ninth dorsal vertebræ lie opposite the third to the tenth ribs respectively.

Thus the tip of the sixth spinous process marks the level of the seventh rib, etc. The tips of the eleventh and twelfth spinous processes are opposite the ribs of corresponding numbers.

Mammary Gland and Nipple.—In the female the mammary gland normally extends from the third to the seventh interspace. In the male the nipple is in the fourth intercostal space.

Scapula.—The scapula extends from the second rib to the seventh rib. Its angle marks the level of the seventh spinous process. The root of the scapular spine marks the level of the third spinous process.

Lines of the Thorax

There are nine vertical lines which are arbitrarily designated to divide the thorax.

Midsternal line.—Marks the median line of the sternum.

Sternal.—Marks the lateral border of the sternum.

Parasternal line.—Lies midway between the sternal and midclavicular lines.

Midclavicular (Mammillary) line.—Is drawn vertically downward from a point midway between the two ends of the clavicle.

Anterior axillary line.—Is drawn downward from the anterior axillary fold.

Midaxillary line.—Is drawn downward from the midpoint of the axilla.

Posterior Axillary line.—Is drawn downward from the posterior axillary fold.

Scapular line.—Is a vertical line passing through the angle of the scapula.

Midspinal line.—Marks the line of the spinous processes.

There are seven horizontal lines; four at the anterior and three at the posterior. It is obvious that these cross the vertical lines at right angles and thus serve to divide the thorax into many "checkerboard" areas. It is imperative

that the student become thoroughly familiar with the viscera underlying these areas. Information which is gained through routine examination is based on such knowledge. Hence the value of such information and the accuracy of the diagnosis is primarily dependent upon accurate knowledge of underlying organs.

Crico-clavicular line.—Extends from the cricoid cartilage to the outer end of the clavicle.

Clavicular line.—Marks the anterior border of the clavicle.

Third Chondro-Sternal line.—Passes lateralward from the junction of the third costal cartilage with the sternum.

Sixth Chondro-Sternal line.—Passes lateralward from the junction of the sixth costal cartilage with the sternum.

Scapulo-spinal line.—Follows the scapular spine and extends from its root medianward to the midspinal line.

Angulo-Scapular line.—A horizontal line drawn through the angle of the scapula.

Twelfth Dorsal line.—A horizontal line passing through the twelfth dorsal spine.

Areas of the Thorax

The areas of the thorax which are established by the vertical and horizontal lines, together with the viscera which underlies them, must be visualized in order to make the findings of the physical examination valuable. These areas are:

Supraclavicular area.—Lies between the crico-clavicular line and clavicular line. Underlying viscera are apexes of lungs, common carotid arteries, subclavian arteries, subclavian veins, jugular veins.

Sternal area.—Is that area which lies behind the sternum. Underlying viscera are the lower trachea with its bifurcation, anterior border of lungs, ascending aorta, arch of aorta, superior vena cava, left innominate vein, right auricle, most of right ventricle, right borders of both left auricle and left ventricle, part of left lobe of liver.

Infraclavicular area.—Bounded by the sternal line, clavicular line, anterior axillary line and third chondro-sternal line. Underlying viscera on right are upper lung lobe, root of lung providing entrance for right bronchus, right pulmonary artery and right bronchial artery. Underlying viscera on left are upper lung lobe, root of lung providing entrance for left bronchus, left pulmonary artery and left bronchial artery; also major portion of the left auricle.

Mammary area.—Bounded by the sternal line, third chondro-sternal line, anterior axillary line, sixth chondro-sternal line. Underlying viscera on right are parts of right auricle and ventricle, upper lobe of lung, middle lobe of lung, dome of right lobe of liver overlaid with thin edge of lung. The dome of the liver ascends to the fourth intercostal space. Underlying viscera on left are the upper and lower lobes of lung; also major portion of the heart.

Hypochondriac area.—Bounded by the sixth chondro-sternal line, the costal arch and the anterior axillary line. Underlying viscera on right are the complementary pleural space, diaphragm and right lobe of liver. Underlying viscera on left are the cardiac end of stomach, complementary pleural space and diaphragm.

Axillary area.—Bounded by the apex of axilla, anterior and posterior axillary lines and sixth chondro-sternal line. Underlying viscera on both sides are the lungs.

Infra-axillary area.—Bounded by the sixth chondro-sternal line, the anterior and posterior axillary lines and the costal arch. Underlying viscera on right are lower border of lung, complementary pleura, diaphragm and right lobe of liver. Underlying viscera on left are lower border of lung, complementary pleura, diaphragm, cardiac end of stomach and anterior end of spleen.

Suprascapular area.—Lies above the scapular spine. Underlying viscera are the apexes of the lungs.

Scapular area.—Bounded by the scapulo-spinal line, spinal border of scapula, angulo-scapular line and the posterior axillary line. Underlying viscera on both sides are the lungs.

Interscapular area.—Bounded by the two spinal borders of the scapulæ, the angulo-scapular line and a horizontal line through the seventh cervical vertebræ. Underlying viscera on right are the posterior edge of the lung, the right side of the trachea, the right bronchus and the right bronchial and pulmonary arteries. Underlying viscera on left are posterior edge of the lung, the left side of the trachea, the left bronchus, the left bronchial and pulmonary arteries, the descending aorta, the esophagus and the thoracic duct.

Infrascapular area.—Bounded by the angulo-scapular line, the twelfth dorsal line and the two posterior axillary lines. Underlying viscera on right are lower border of lung, complemental pleura, diaphragm, right lobe of liver and upper portion of the right kidney. Underlying viscera on left are lower border of lung, complemental pleura, diaphragm, descending aorta, upper portion of left kidney and the major part of the spleen.

Topography of Pulmonary Thoracic Viscera

Trachea.—The trachea, or windpipe, is about four and one-half inches in length and one inch in diameter. Above it is a continuation of the larynx and below it is terminated by a bifurcation which forms the right and left bronchi, extending to the right and left lungs respectively. The upper end of the trachea is opposite the sixth cervical vertebra while the bifurcation is at the level of the fourth dorsal vertebra. At the anterior this is indicated by a point slightly above the angle of Louis.

Bronchi.—These two divisions extend outward from their origins in the trachea to enter the lungs at their roots. The right bronchus extends almost vertically downward to terminate at the level of the fifth dorsal vertebra. It is about one inch in length and is slightly greater in diameter than is the left. The left bronchus is more nearly horizontal. It is two inches in length, slightly less in diameter than is the right and its lower terminus is opposite the sixth dorsal vertebra.

The Right Lung.—The apex of the right lung extends from one to one and three-quarters inches above the clavicle. From here the anterior border extends to the mid-sternal line at the level of the second rib. Thence downward to the sixth chondro-sternal articulation. Thus it can be seen that much of the anterior border lies behind the sternum. There, however, is a thin border overlying the contents of the right mediastinal. At the sixth chondro-sternal articulation the lower border of the lung begins. Here the border bends sharply outward and follows the sixth rib to the mid-clavicular line. Continuing to the right the lower border lies at the level of the eighth rib at the mid-axillary line. At the posterior the lower border is at the level of the tenth rib in the scapular line and at the level of the eleventh rib at the spine. This entire lower border forms a thin edge because of the convexity of the diaphragm. The right lung has three lobes. The fissure which divides the upper and lower lobes begins at the third dorsal vertebra and extends downward, outward and forward to cross the fourth rib at the mid-axillary line. Here it bifurcates. One division follows the fourth rib and cartilage to the sternum. The other division passes downward and forward to terminate at the lower border of the lung in the mid-clavicular line. It is between these two latter fissures that the wedge-shaped middle lobe lies. Thus it can be seen that the surface of the middle lobe is at the lower front and side of the thorax. It is equally obvious that the upper lobe covers the greatest area in front, while the lower lobe covers the greatest area at the posterior.

The Left Lung.—The apex of the left lung extends from one to one and three-quarters inches above the clavicle. From here the anterior border extends downward and forward to a point beneath the left edge of the sternum at the angle of Louis. From here it extends downward to the level of the fourth chondro-sternal articulation with its border barely under the sternum. It then curves outward, downward and slightly inward to the level of the sixth rib. Thus it forms

a superficial semicircular area under which lies the mediastinal viscera. At the sixth rib the border bends sharply outward to cross the eighth rib at the mid-axillary line, the tenth rib at the scapular line and the eleventh rib at the spine. The lower border of the left lung lies very slightly lower than the lower border of the right lung.

The left lung has two lobes divided by a single fissure. This fissure begins at the level of the third dorsal vertebra, extends outward and downward and forward across the fourth rib at the mid-axillary line, continues forward and downward to terminate at the lower border of the lung in the mid-clavicular line. Thus it can be seen that the surface of the upper lobe occupies the greater portion of the anterior thorax, while the surface of the lower lobe occupies the greater portion of the posterior thorax.

Because of the greater tone possessed by the lungs in early life it is found that in children the lower border of the lungs lies approximately one rib higher than indicated above while in old age when tone is deficient it is one rib lower. For all practical purposes the student should fix in his mind that at the anterior the lower border lies at the sixth rib, at the sides at the level of the eighth rib, and at the posterior at the level of the tenth rib.

The Pleuræ.—Each lung is surrounded by a closed pleural sac which does not communicate with the pleural sac of the opposite side. The pleura consists of two layers, between which is a potential cavity containing sufficient serum that they may readily glide upon one another. The outer division of the pleura (parietal layer) is closely attached to the inner wall of the thorax, the diaphragm and the mediastinal viscera. At the root of the lung it is reflected upon itself to form the visceral layer. The visceral layer closely invests the surface of the lung. Because there is a potential vacuum between these two layers the lungs are held continually "on the stretch." The attachment of the diaphragm to the trunk wall is at a lower level than the border of the lungs. Hence a

complemental space lies between the diaphragm and the thoracic wall into which the borders of the lungs are sucked when the diaphragm contracts and flattens. The extent to which this complemental space extends below the lower border of the lung varies. At the anterior it is about two inches lower; at the sides about three and one-half inches lower while at the posterior it is about one and one-half inches lower. Thus it can be seen that when the diaphragm is relaxed a part of the parietal layer covering the diaphragm is in contact with the lower border of the parietal layer lining the thorax. It is only upon deep inspiration that these two surfaces are drawn apart and at that time the lower borders of the lungs descend to fill that space.

Physiology of Respiration

The lungs may be considered as honeycombed organs. The minute divisions of which are known as the air sacs or infundibuli. These air sacs may be compared to the grapes arranged in a single huge bunch. We may consider the main stem of the bunch as the bronchus and all the subdivisions leading to the grapes as the smaller bronchial divisions. It is through the walls of the air sacs that the interchange of carbon dioxide for oxygen occurs. The carbon dioxide is in the blood contained in minute capillaries on the outside wall of these air sacs. The oxygen is inside the air sacs. It is obvious that in order for the blood to be constantly renewed with oxygen and in order for the carbon dioxide to be carried away from the air sacs that there must be a constant exchange between the air in the lungs and that in the outer world.

The potential vacuum between the parietal and visceral layers of the pleura produces constant traction on the lungs and forces them to conform to the contour of the thoracic wall. Thus when this thoracic wall changes its position the lungs must follow. The thorax is enlarged during

the act of inspiration by the contraction of the diaphragm together with the contraction of those muscles which serve to elevate the ribs. The elevation of the ribs increases the lateral diameter and the antero-posterior diameter of the thorax while the contraction and flattening of the diaphragm increases the vertical diameter. Thus the size of the thorax is increased producing an increase in the size of the lungs. This increase in the size of the lungs tends to decrease its air pressure and air passes in through the respiratory passages in consequence.

In quiet expiration no muscular contraction occurs. The muscles which have produced inspiration merely relax, giving an opportunity for the natural elasticity of the lungs to express itself. This elasticity pulls up the diaphragm, pulls down the ribs and squeezes the air out.

Nervous Mechanism.—The respiratory center which lies in the medulla is divided physiologically into an inspiratory center and an expiratory center. The expiratory center is brought into use only in case of forced expiration and then for the purpose of producing contraction in the abdominal muscles to hasten expiration. The responsiveness of this center is determined by the amount of carbon dioxide contained in the blood. This carbon dioxide acts as a hormone and when it is present in abundance the respiratory center is highly responsive. When the carbon dioxide, however, is deficient the responsiveness is proportionately decreased. The chief afferent nerves of respiration are the vagi. These nerves respond when the lungs have reached a certain degree of collapse and the result is motor impulsés sent to the diaphragm and other respiratory muscles. Toward the end of inspiration, when a certain degree of expansion has occurred in the lungs, the vagi again respond and the result is inhibition. The principal efferent nerve is the phrenic, which supplies the diaphragm with motor impulses in response to the demands made through the vagus. It is obvious that injury to either the phrenic or the vagus on one side will lead

to paralysis of the diaphragm on that side while injury to the nerves on both sides will lead to complete paralysis of the diaphragm and almost complete suspension of breathing. It is equally obvious that injury to the respiratory center in the medulla leads to cessation of breathing.

Inspection and Palpation of the Thorax

The author wishes to emphasize the value of inspection and palpation in all routine examinations where abnormalities of the lungs are suspected. Too often the inexperienced examiner is concerned chiefly with the findings made through auscultation and fails to note very obvious conditions which might be gained through inspection and palpation.

It is essential that three methods of investigation be employed and the examiner is urged to not make the error of depending upon any one channel of investigation. Inspection and palpation constitute one method. Percussion constitutes the second method and auscultation constitutes the third. Each is a verification of the other two and by combining the findings of all the greatest accuracy can be attained.

Preparation and Method.—The chest of the patient should be bared in order to achieve the best results through inspection. The investigator should inspect the front of the chest, the back of the chest and the sides of the chest, comparing the two sides in all cases. In this work it is necessary that a good light be upon the surface under inspection. Finally, and perhaps most important, the chest should be inspected from above. In doing so the examiner sees as it were a cross section, is able to compare depth on the two sides, is able to detect minor enlargements or depressions in the surface which might otherwise escape his notice.

Normal Chest.—The normal chest should be visualized as a cone-shaped cage, the base of the cage being downward and the apex marked by the first ribs. The shoulders formed by the clavicle and scapula should not be considered in visualiz-

ing the shape of this bony cage which encloses the thoracic viscera. Normally the right side of the chest is slightly larger in right-handed individuals and oftentimes a very slight right curvature of the spine is noted. The prominence of the clavicle has no great significance unless very marked depressions are observed above it and below it. There is normally a slight depression below the outer half of the clavicle which is known as Mohrenheim's Fossa. The costal arches ascending and converging unite at the lower end of the sternum to form the infra-sternal angle or "pit of the stomach." This angle is normally from seventy to eighty degrees.

Measuring the Chest.—An ordinary linen tape is all that is necessary to make such measurement. If a steel tape is used care should be taken to see that the sharp edges do not cut the flesh. The measurement should always be made at the level of the nipples and extreme care must be exercised to see that the tape passes around in a horizontal line. The size of the chest varies greatly but is normally about five inches greater in men than in women. Normal expansion is from two to five inches. Deficient expansion is greater cause for concern than excessive expansion. The relation between the antero-posterior and the lateral diameters of the chest is as three to four.

Deformities of the Thorax

Deformities of the thorax may be congenital; they may result from spinal curvature, constitutional disease or occupation. In children, unless the deformity is congenital or rachitic, it is usually associated with obstruction in the upper air passages, more especially from adenoids. In the adult, deformity is most often associated with pathology in the thoracic viscera. It is obvious that deformity may be either unilateral or bilateral and that the character of deformity is a very important factor in determining the pathology which is responsible.

Bilateral Deformity

Pterygoid or Phthisical Chest.—The characteristics of this form of chest are:—shallow from before backward; flat and often concave anteriorly; very prominent clavicles with deep fossæ above and below; drooping shoulders; long neck; very prominent scapulæ; head inclined forward; acute angle of ribs both at the back and in front, thus forming an acute infrasternal angle; finally there is emaciation and often a loss of both tone and size of the muscles investing the thorax. It is significant of chronic phthisis when well marked. When less pronounced it is significant of a phthisical diathesis or of an arrested case.

Emphysematous (barrel) Chest.—The characteristics of this form of chest are:—elevated ribs giving the short, broad shape; large infrasternal angle; antero-posterior diameter equal to or greater than lateral diameter; shoulders elevated and "square"; head tilted slightly back; large intercostal spaces; greatest enlargement in middle and upper chest; kyphosis in upper and dorsal region. It is characteristic of hypertrophic pulmonary emphysema.

Rachitic Chest.—The characteristics of this form of chest are:—increased antero-posterior diameter; decreased lateral diameter; abnormal forward "flare" of the sternum due to the soft, flat ribs being drawn inward at the sides of the thorax; very acute infrasternal angle; nodular enlargement develops at the junction of the ribs with the costal cartilages and this series of enlargements, being parallel to the sternum, is called the "rachitic rosary." Harrison's sulcus is a line of depression from the ensiform cartilage, downward and outward, marking the attachment of the diaphragm. It is produced by the inward pull of the diaphragm on the soft thoracic wall. The rachitic chest is not significant of pulmonary disease.

Pigeon (keel) Chest.—The characteristics of this form of chest are:—an acute bending at the angle of the ribs with a consequent straightening of the anterior end of the ribs.

This results in a prominent sternum, limited room in the anterior thorax, and upon cross section a triangular shape of the chest. It is commonly found in the advanced stages of rickets or in cases of rickets associated with obstruction in the upper air passages.

Funnel Chest.—This type of chest is characterized by depression of the lower end of the sternum, giving a concave shape in the vertical direction. The depression sometimes extends as high as the third rib. It is usually congenital or occupational and is not significant of pulmonary disease. Like the rachitic and pigeon chest, however, it decreases the total size of the thorax and by limiting the activity and expansion of the lungs predisposes to pulmonary disease.

Unilateral and Local Deformity

Unilateral Enlargement is characterized by a more horizontal position of the ribs, wider intercostal spaces, raised shoulder on the enlarged side, scoliosis with convexity toward the enlarged side, increased semi-circumference and antero-posterior measurements on the enlarged side. Such enlargement may be primary or compensatory. If primary it is due to increased size of the viscera or to accumulation of gas, serum, blood or pus either in the lungs or pleura. If in the pleura the enlargement is toward the base of the lungs and the intercostal spaces usually bulge slightly. If the enlargement is compensatory to decreased expansion in the opposite lung the enlargement is rendered even more pronounced by comparison with the opposite contracted side.

Local Prominence on the front or sides of the thorax are due to an abnormal chest wall or to enlargement of one or more of the internal viscera. It may be due to a malformation of one or more ribs, perhaps from previous fracture. It may be due to a tumor in the thoracic wall. Either of these two conditions are readily detected by palpation. Localized sero-fibrinous pleurisy leads to local prominence; also neoplasm of lungs or pleura, fluid filled cavity in the lungs,

pericardial effusion and enlargement of the heart. Protrusion of the sternum may be due to aneurism of the aorta and rarely to malignant disease of the underlying lymphatics. Protrusion in the left hypochondrium is indicative of splenic enlargement: on the right side to enlargement of the liver. Marked and acute scoliosis is significant of caries.

Unilateral Contraction is characterized by decrease in antero-posterior diameter, increased lateral diameter and decreased circumference. The shoulder on the affected side droops and a spinal scoliosis, with the concavity toward the affected side, develops. The ribs present a more acute angle and the intercostal spaces are narrowed. This condition indicates that the viscera on the involved side is given less room for expansion and in consequence a compensatory emphysema develops on the opposite side. Unilateral contraction most often indicates chronic pulmonary tuberculosis. Other causes are fibrosis of interstitial pneumonia, fibroid phthisis or extensive adhesions of the pleura which practically obliterates the pleural cavity.

Local Depression immediately above and below the clavicle is chiefly indicative of apical pulmonary phthisis. Next in importance it is significant of fibrosis. Ulcerative phthisis with resultant cavity may also cause such depression. In addition we should consider localized adhesions, fractured ribs, and pulmonary abscess. If on the posterior wall, abscess is most often indicated; on the lateral wall, adhesions.

Respiration

Frequency of Respiration.—The examiner should note the frequency of the respiration without the knowledge of the patient. Should the patient know that his respiratory rate is being observed he may alter it without conscious volition. The rate of respiration at birth is 44 per minute. At the fifth year it is 26 per minute and in the adult approximately 18 per minute. It is well to note here that in the adult the pulse respiration ratio is 4 to 1.

Rapid respiration may or may not be associated with dyspnoea. Physiologically the respiratory center is super-responsive under all forms of mental stress. Thus anger, joy, or excitement are all associated with increase in the respiratory rate. Muscular exertion, because it produces a larger quantity of carbon dioxide, also increases respiration. These factors should be discounted in any conclusions based on respiratory rate. An extremely rapid respiration is often associated with hysteria. If indicative of pulmonary disease, lobar pneumonia is the most common cause. In fact any pathological condition which decreases the aerating surface leads to rapid respiration.

Abnormally slow respiration indicates a physical condition where the respiratory center has been deadened and is only slowly responsive. This is the condition which prevails in poisoning from chloroform, opium and other drugs. It is also found in various forms of coma and in collapse.

Types of Respiration.—There are two predominant types of respiration—Thoracic and Abdominal. The thoracic type is normally present in women while the abdominal type predominates in men and children.

If the thoracic type is excessive it indicates non-activity of the diaphragm for some cause. Abdominal tumors, ascites, or gas in the abdomen are factors which limit the action of the diaphragm and result in thoracic breathing. This is also true of peritonitis, appendicitis or abdominal abscess. Inflammation of the diaphragmatic pleura leads to thoracic breathing. Excessive pericardial effusion or excessive pleural effusion may by virtue of additional weight on the diaphragm limit its mobility. Paralysis of the diaphragm either unilateral or bilateral has a like effect. It is also to be observed that excessive thoracic breathing is often associated with hysteria.

Excessive abdominal breathing indicates that some condition exists to limit the mobility of the thorax. This is the case in hypertrophic emphysema where the constant respira-

tory effort has led to a chronic condition of elevated ribs. It is also present in calcification of the costal cartilages and in paralysis of the thoracic respiratory muscles. Pleurisy involving the upper parts of the lung or fractured ribs which have led to pleural inflammation are causative factors.

Degree of Respiration.—To note the degree of expansion is important in that it discloses with some degree of accuracy, whether or not sufficient air is entering the lungs. Inspection from the front, sides, back and from above should give a fairly accurate judgment regarding the comparative expansion on the two sides. This method should be supplemented by palpation with the flat of the hands. It should be observed whether there is excessive or diminished expansion in any area. For the greatest accuracy in this connection the tape measure should be employed. Care should be taken to see that the tape is horizontally placed and at the level of the nipples. In men the expansion should be at least two inches and in women two and one-half inches. If a spirometer is used to measure the quantity of air which can be exhaled after the greatest inspiration it should not fall below a given amount, which amount differs in men and women. In men the normal amount is $3\frac{1}{2}$ times the height in inches. In women the amount is 2.3 times the height in inches. Therefore in a man six feet tall the respiratory capacity should be $72 \times 3\frac{1}{2}$, or 252 cubic inches.

Deficient expansion may be bilateral or unilateral. If the degree of general expansion is materially decreased pulmonary tuberculosis should be first suspected. This is particularly true if the general expansion falls below two inches. Other conditions which are indicated by decreased general expansion are pleurisy, pneumonia, intercostal neuralgia, angina pectoris or pleural pain due either to inflammation or a fractured rib. Paralysis of the respiratory muscles, the bronchial constriction associated with asthma and emphysema are also causative factors. Obstruction of the trachea from any cause or a decrease in size in the larynx

offer mechanical interference with inhalation and thus lead to decreased expansion. Finally we should recall that extreme weakness may be a causative factor in poor general expansion.

Unilateral and local deficiency are caused by fluid or air in the pleura, extensive adhesions of the pleura, obstruction of one or more bronchi, pathological changes of tuberculosis which render part of the lung functionless. If the deficient expansion is on the right side it may be due to an enlarged liver. If the deficient expansion is at the apex of the lung and is especially marked by depression above and below the clavicle, phthisis should always be suspected. It should not be forgotten, however, that pneumonia with the consequent consolidation may render a part or all of one lung functionless. In most of the above mentioned conditions the associated symptoms will serve to exclude some and point more clearly to others.

Increased expansion occurs following exertion, during hysteria, in some forms of dyspnoea. If the increased expansion is unilateral or local it is usually compensatory to decreased expansion in other lung regions.

Respiratory Bulging and Retraction.—Bulging or retraction in the intercostal spaces should not be confused with emaciation or an especially well developed thorax.

Retraction occurs only during inspiration. If it is general it is indicative of bronchial obstruction or double bronchopneumonia. If it is localized it is indicative of obstruction of a bronchus, pleural adhesions or pulmonary collapse which sometimes occurs in infants. The reason that retraction occurs in these conditions during inspiration is that the lungs are unable to follow the rapid expansion of the thorax.

Bulging occurs as a rule during the expiratory act and is usually associated with bronchial obstruction. This condition is well shown in the expiratory dyspnoea of asthma. It is usual that retraction and bulging occur alternately during the act of inspiration and expiration respectively. The only

condition wherein bulging occurs during inspiration is in the case of emphysema where the apexes of the lungs are chronically enlarged and protrude above the clavicles.

Respiratory Rhythm.—Respiration normally occurs at the rate of from fourteen to eighteen per minute. Inspiration is slightly shorter than expiration. The ratio being as of five to six. Normally there is a slight pause at the end of the expiration. It should be here noted that respiration is somewhat irregular in children while awake or during restless sleep and this condition in these cases has no important diagnostic significance.

Sighing is a form of irregularity in rhythm which occurs in certain diseases. It is indicative of an overabundance of carbon dioxide in the blood. It is commonly found during periods of emotional stress, hysteria or melancholia. An overdistended stomach by limiting the movement of the diaphragm may bring about a condition of excess carbon dioxide and consequent sighing. Meningitis, lesions of the medulla, the typhoid state, hemorrhage, collapse of syncope all disclose this irregular respiration. Finally it should be remembered that sighing occasionally occurs in persons who are entirely normal, but whose physical inactivity leads to shallow respiration and improper oxygenation.

Simple irregularity in breathing is associated with collapse, apoplexy, meningitis, lesions of the medulla or other conditions which will affect the respiratory center. A pause at the end of inspiration is found in acute pneumonia.

Cheyne-Stokes Breathing is a type of breathing where the respiratory act is entirely suspended for perhaps thirty seconds. This is followed by a gradually increasing rapid breathing until an apex of deep, rapid breathing is reached. This is followed by gradual decrease until a period of apnœa again occurs. These cycles from apnœa to apnœa occupy from thirty seconds to two minutes. This condition may persist for hours or days and in very rare cases for weeks. It is a symptom of extreme gravity and usually presages a

fatal termination. It really indicates a beginning failure of the respiratory center. This condition is associated with apoplexy, chronic nephritis, meningitis, brain tumor, embolism, diabetes, typhoid fever, pneumonia, pertussis, scarlet fever and all forms of profound septic conditions.

Jerking respiration is usually found where thoracic breathing predominates. If found during inspiration it is usually associated with asthma, hysteria, pleurisy and fractured ribs. If found during expiration it is associated with pleurodynia, adhesions or a fractured rib.

Stertorous breathing (snoring) is often a normal condition during sleep. It is found also when the patient is unconscious from apoplexy, uremic poisoning, narcotic poisoning and diabetes. If present during sleep it leads to a suspicion of adenoids or enlarged tonsils.

Stridulous respiration usually occurs during the act of inspiration and results from a constriction of the larynx. It is described as a whistling, screeching or harsh sound. It may be due to obstruction of the larynx or paralysis of the abductor muscles. It is also due to inflammation, edema or tumor of the larynx; to the presence of a foreign body or to spasmodic croup, laryngismus stridulous, strychnine poisoning or tetanus. It may also occur from pressure on the inferior laryngeal nerve and this in turn may result from tumor, aneurism or enlargement of the bronchial glands.

Dyspnœa.—Labored breathing is called dyspnœa. It is characterized by greater frequency in the respiratory rate and by the apparent employment of the muscles used in forced respiration. In extreme dyspnœa there is cyanosis. The dyspnoea may be inspiratory or expiratory or both.

The clinical picture of dyspnœa is more or less familiar to all. The expression is anxious, the pupils dilated, the nostrils distended and the mouth open. The thorax, abdomen or both heave. Often there is cold perspiration, the muscles of the neck are seen to contract and the shoulders are elevated. To accomplish this latter the patient often rests

the weight on the hands or places the arms over the back of a chair or a window sill.

Primarily the condition is due to the inability to obtain the proper oxygen supply for the needs of the body. In extreme muscular exertion much oxygen is used and large quantities of carbon dioxide are thrown into the blood stream. Temporary dyspnoea may appear under such condition even when there is no evidence at other times of any difficulty.

It is evident that any obstruction in any part of the air passages may result in dyspnoea. The obstruction may be in the nasal cavities, the pharynx, the larynx, the trachea or the bronchial tubes. Reason will readily suggest some of the more common obstructions. These include enlarged turbinates, adenoids, enlarged tonsils, laryngeal abscess, aortic aneurism, mediastinal tumor, etc. It is equally evident in pulmonary disease which limits the surface of the lungs. In this connection it is also necessary to include those conditions of the pleura which limit lung mobility; also cardiac diseases which result in pulmonary stasis; and finally those diseases of the blood which reduce its oxygen-carrying capacity. The most common causes are debility, anæmia, cardiac or renal disease and pulmonary insufficiency. It is obvious therefore that examination should be made of the heart, lungs, air passages, urine and blood.

Dyspnoea on exertion (but not constantly present) indicates obesity, anæmia, debility, partially compensated valvular lesions, myocarditis, bronchitis, emphysema, pleural effusion and early tuberculosis.

Constant dyspnoea may indicate anæmia, marked debility, valvular lesions with lost compensation, marked pleural effusion, laryngeal stenosis, bronchopneumonia, lobar pneumonia, fibrinous bronchitis, phthisis, large pleural effusion, arterial hypertension from diabetic acidosis.

Paroxysmal dyspnoea indicates acute indigestion, bronchial asthma, spasmodic croup, chronic nephritis, cardiac disease, or pressure from any cause on the vagus nerve.

Inspiratory dyspnœa is associated with intercostal depression during the inspiratory act. It may result from a foreign body or tumor in the larynx above the vocal cords. Paralysis of the abductors, spasm of the adductors, edema and inflammation of the larynx are all causative factors.

Expiratory dyspnœa may be evidenced by bulging at the intercostal spaces during the expiratory act. Most often it indicates pulmonary emphysema or bronchial asthma. The inspiration is short and gasping while the expiration is long and wheezing. This form of dyspnœa in rare cases indicates a polypoid growth below the vocal cords.

Fremitus

Vibration of the thoracic wall which is detected by the sense of touch is called Fremitus. Vocal fremitus results from vibration from the vocal cords. Bronchial fremitus results from vibration in the bronchial tubes. Pleural fremitus results from friction in the pleura. Succussion fremitus results from fluid and air in the pleural cavity.

Fremitus is detected by placing the palms of the hands or the tips of the fingers on the thorax. To detect fremitus at the apexes the index finger should be laid flat immediately above the clavicle. To detect intercostal fremitus the fingers also are employed.

Vocal Fremitus

In order to make practical use of the various degrees of fremitus one must understand how the vibration of the thoracic wall is produced. If the examiner has this knowledge and a clear mental picture of the structures contained in the thoracic cavity his findings become a matter of reason and thus far transcend in importance that information which is acquired through memory and without understanding.

During phonation the vibrations of the column of air in the larynx travel outward from that organ in all directions. This is readily demonstrated by placing the fingers on the

throat of one who is speaking and sensing there the vibrations which have traveled from the larynx to the surface. It is obvious that these vibrations will be readily detected because of the proximity of this surface to their origin.

The column of air below the larynx also vibrates and these vibrations are transmitted downward through the trachea, the right and left bronchi and finally to the terminal bronchioles and pulmonary alveoli. In thoracic examinations we are naturally interested in these vibrations which are transmitted by the air in the air passages and in lesser degree by the bronchial wall and lung tissue. From the pulmonary alveoli underlying the pleura these vibrations pass through the pleura and through the thoracic wall to the surface. They are of course modified and decreased in intensity the further they travel from their source.

It should here be recalled that the lungs are elastic organs and the ease with which vocal fremitus is detected depends upon their tone as well as the proximity of the air to the surface. Practice will readily demonstrate these vibrations over all parts of the lung surface. Experience will readily show that the deep bass voice produces slower vibrations which are more readily detected than those of a higher pitch. Thus it is that in men vocal fremitus is more readily detected. It will also be found that the intensity of the fremitus depends upon the volume of the tone. Thus if the patient speaks in a loud voice the fremitus is very apparent while graded decreases in the volume decreases the fremitus until in whispering it cannot be detected at all.

For these reasons the patient should be instructed to repeat the words "ninety-nine" over and over again while the fremitus is being tested. He should also be instructed to use a constant pitch and a constant volume.

In general it may be said that the fremitus is more clearly detected at the anterior of the thorax, less clearly at the sides and with least clearness at the back. It will also be found that the fremitus on the right side particularly in the

region over the right bronchus is more clearly felt than that over the left bronchus. The reason lies in the larger column of air in the larger right bronchus. The nature of the thoracic wall must be taken into account. In thin, emaciated individuals the fremitus is normally more easily detected, whereas if the thorax is overlaid with muscle and fat it is more difficult to detect.

Practice in detecting vocal fremitus will enable the examiner to definitely determine the lower border of the lungs. As the hands are moved downward to the region over the liver the fremitus abruptly ceases.

Abnormal Vocal Fremitus.—If one keeps in mind the reason for the production of vocal fremitus he has a sound basis upon which to establish the cause of increased or decreased vocal fremitus. It is obvious that if the vocal fremitus is increased there must be a more perfect conductor than is the case in the normal lung. It is equally obvious that if the vocal fremitus is decreased it results from a less perfect conducting material.

In the main it may be stated that an increased vocal fremitus indicates an abnormal condition of the lung tissue, whereas decreased vocal fremitus is significant of pleural involvement. There are, however, certain exceptions to this general rule which will be pointed out in the following paragraphs.

Vocal fremitus is increased in all forms of consolidation where the consolidation lies close to the surface of the thorax and extends inward to a communication with the air column. A consolidation of the lower lobe of the lung yields increased vocal fremitus providing the lower branches of the right bronchus are open. If, however, these lower branches should for any reason become occluded then the column of air from the larynx will be shut off from communication with the consolidated area and fremitus will be decreased or absent.

Pulmonary disease with consolidation which usually produces increased fremitus are pneumonia, phthisis, hemorrhagic

infarction, neoplasm, atelectasis due to external pressure, connective tissue induration, etc. Lung cavities which communicate with a large bronchus are excellent conductors and greatly increase the vocal fremitus. This is also true of consolidations which reach the larger bronchial tubes. Large pleural effusions which greatly compress the lung also increase vocal fremitus because the fluid and compressed lung act as one solid body filling a greater or less space in the thorax. If a more limited pleural effusion develops the fremitus is decreased in the lower part of the lung immediately under which the fluid lies, but is increased above this line due to the compression of the lung tissue. Bronchiectasis is the only bronchial affection which discloses an increased vocal fremitus. Pleural adhesions are also in some cases the cause of increased fremitus.

Diminished vocal fremitus results chiefly from two causes. These are stenosis or occlusion of the bronchi and the presence of gas or fluid between the layers of the pleura.

Obstruction of the bronchi may result from several causes. It may be produced by tenacious accumulations, by the presence of foreign bodies, by aneurism, by pericardial effusion and by the development of cicatricial tissue in the wall. Partial stenosis leads to decreased fremitus while complete obstruction leads to entire absence of fremitus. The area over which the vocal fremitus is decreased or absent is of course determined by the extent to which the lung is supplied by the tubes involved. Pneumothorax, Hydrothorax, hemothorax and pyothorax are all conditions which separate the two layers of the pleura and decrease its conducting ability. Thus the vocal fremitus is deadened or entirely obliterated.

The ability of the examiner in determining the uppermost limit to which the fluid in the pleura extends enables him to determine with considerable accuracy the progress which is being made in its absorption. A sudden descent, however, of this upper line of limitation is usually the result

of relaxation of the diaphragm due to the increased weight of the fluid.

Rhonchal Fremitus—or bronchial fremitus—is due to vibrations in the bronchi. Mucus, pus, blood and serum are all substances which when accumulated in the bronchial tubes may vibrate to produce rhonchal fremitus. Thus it can be seen that fremitus of this character has a variable diagnostic significance. The rhonchal fremitus which is palpated over the upper sternal area, the lower part of the infra-clavicular area and the upper part of the mammary area are usually not of grave significance, but most often indicate inflammation in the larger bronchi. On the other hand, rhonchal fremitus in the upper part of the infra-clavicular area and in the supra-clavicular area is significant of phthisis and is of grave diagnostic import. Rhonchal fremitus from this latter cause is not so pronounced as in the less grave condition.

Rhonchal fremitus should not be confused with pleural fremitus. The latter is usually attended with pain, which pain is increased on pressure in the intercostal space. Pleural fremitus is not affected by coughing, whereas rhonchal fremitus often is.

Pleural Fremitus—is the fremitus which results from the friction between the two layers of the pleura. It is present in acute fibrinous pleurisy and also in the early stages of sero-fibrinous pleurisy. This type of fremitus is of a peculiar grating character and is accompanied by pain. Both the fremitus and the pain are increased upon pressure in the intercostal spaces over the area involved.

Succussion Fremitus.—This type of fremitus results from the splashing of fluid contained in the pleural cavity against the thoracic wall. It is only found in those cases where sufficient air is contained in the pleura to allow free movement of the fluid.

Percussion

The Principle of Percussion.—Everyone is familiar with the method employed to locate a studding in a frame wall. By

tapping on the wall a certain degree of resonance is detected which is least directly over the studding while it is greater between adjacent studdings. The reason is that in the one case the wall vibrates less than in the other. This principle is employed in percussion on the human body. If a portion of the body is struck with a sharp staccato stroke a certain sound is elicited. The character of this sound depends upon the character of the tissues underlying the surface struck. If the sound produced vibrates with some definite regularity as is the case over the lungs it is said to be resonant or clear. Somewhat the same character of sound may be elicited by sharply tapping bony structures. If, however, we percuss a soft, thick muscle the sound produced is flat or dull. Here there is not the same character of resonant regular vibrations. In the main it may be said that air containing organs vibrate with a characteristic resonance yet this resonance is modified by the structure of the organ and the amount of air contained. If we percuss over the stomach the note yielded is drum-like and is classed as tympanic. Percussion over the lungs produces an entirely different character of resonance with which the examiner becomes familiar through practice. In brief, the purpose of percussion is to determine the character of the tissues below the surface struck. By familiarizing ourselves with the normal percussion note we are enabled to detect the abnormal notes and thus determine pathological change which may have developed.

In practical employment percussion detects the amount of air below the surface. Another important purpose is to outline the borders of organs. Thus the percussion note over the liver is dulled, whereas the percussion note over the lungs is resonant. Thus the examiner determines the exact location of the lung border.

The Application of Percussion.—In the practice of percussion a small rubber tipped hammer may be employed as the plexor or striker. Also a hard rubber or metal tube may be placed on the surface of the body to intervene between the

surface and the plexor. This intervening structure is known as the pleximeter. Usually, however, the examiner finds it convenient to use the fingers of one hand as pleximeters and one or more fingers of the other hand as plexors.

Sometimes it is desirable to strike the surface of the body directly with the plexor. This type of percussion is known as direct or immediate percussion. When, however, a pleximeter is employed it is known as indirect or mediate percussion. Indirect percussion is employed for most practical purposes.

The pleximeter finger should be held flat against the surface under examination and with a reasonable degree of firmness. By doing so the vibratory tone of the surface under examination is more readily detected. The examiner should assume a position that is as comfortable as possible both to himself and the patient. Care should be taken to see that the pleximeter finger is in contact throughout its entire length and does not arch away from the surface. The plexor finger may be any of the fingers of the opposite hand although the index or middle fingers are most commonly employed. This is a matter of personal choice. This plexor finger should be bent so that the last two phalanges are approximately at right angles to the proximal phalanx. The most convenient place to strike the pleximeter finger is at the root of the nail. This pleximeter should be struck squarely, care being taken to avoid striking a glancing blow. Care should also be taken to see that the direction of the stroke is perpendicular to the surface under examination. In all events the stroke is a staccato stroke being given from the wrist. The beginner must avoid the error of employing a too strong percussion stroke and of using the entire forearm. Two or three strokes in one area are all which should be employed. To strike repeatedly only serves to "tire the ear" and destroy one's accuracy of judgment.

Interpreting the Percussion Sound.—In interpreting the sound those factors which are to be studied are the pitch, vol-

ume, duration and character. If the air under the surface is extensive the pitch is low, the volume is great, the duration is extended and the character is one of great resonance or tympany. If the contained air is small in quantity or absent the pitch is high, the volume small, the duration short and the character flat. At one end of the scale of sound may be placed the tympanic variety. This variety is extremely resonant or drum-like. At the other end of the scale may be designated the flat sound which is similar to the sound elicited by tapping a piece of putty. Between these two extremes is the normal resonant sound. It is, of course, necessary that the examiner familiarize himself with the normal character of the percussion note which is found in various areas of the body.

It is, of course, evident that the amount of muscle or fat overlying the air containing viscera will modify the percussion sounds, and this should always be taken into account in any judgment of them.

The strength of the percussion stroke should be modified to meet the requirements. In the case of an extremely heavy thoracic wall it will be necessary to increase the strength of the stroke in order to elicit lung sounds. As a general rule it may be said that the percussion sound is the vibratory response of the tissue to which the percussion stroke penetrates. Thus, if one is demonstrating deep consolidation of the lung it is necessary that the stroke be strong. If one is demonstrating a superficial consolidation the stroke should be light. Beginners usually err in using a too strong percussion stroke. The nice shades of sound are lost through this error.

In outlining organs a delicate percussion stroke should be used. This is readily demonstrated by percussing downward over the lower lobe of the right lung. As we near the lower margin of the lung where it overlies the liver a delicate percussion stroke elicits normal lung resonance, but a powerful stroke penetrates this thin edge of the lung and gives a note of liver dullness. Likewise, as we percuss downward

over the right lobe of the liver toward its thin edge we obtain the liver dullness only through using a light stroke. If a too strong stroke is used the thin edge of the liver is penetrated and abdominal tympany is heard.

Palpatory percussion is a variety of percussion where the plexor finger or fingers are permitted to remain on the surface struck. This form of percussion may be either direct or indirect and its purpose is to gain information regarding the underlying structures both through the sense of hearing and the sense of touch. It is particularly useful in detecting consolidations and accumulations of fluid.

Auscultatory percussion is especially useful in outlining organs. The stethoscope is placed approximately over the center of the organ and percussion is made from the stethoscope outward in straight lines and in various directions. It is observed that when the border of the organs is reached the character of the sound heard through the stethoscope is modified. By marking the points where such modification takes place in the several directions an accurate outline of the organ can be made.

Percussion of the Lungs

Percussion of the lungs is for two purposes. First, to determine the lung boundaries and, second, to determine whether more or less than the normal amount of air lies under the surface percussed.

It is preferable for the patient to assume the upright posture with the head turned neither to the right nor left. If the patient is confined to bed and the upright posture is not practical he should be gently turned from side to side to expose all surfaces being examined. If in the upright posture the patient should be sitting in an easy comfortable position with the arms hanging freely at the sides when percussion of the anterior thorax is made. When the sides of the thorax are being percussed the hands should be clasped above the patient's head. When the posterior thorax is being percussed

the patient should lean slightly forward with the arms folded on the chest or the elbows brought close together.

The examiner should take care to percuss both sides of the thorax in order to obtain a comparison.

Routine examination should be made by first percussing both apexes. Next the examiner should percuss downward in the midclavicular line on both sides, taking into account the final modification from the liver at the lower border of the right lung and the modification of the heart and stomach toward the lower part of the left lung. Percussion should then be made in the midaxillary line from above downward recognizing the liver dullness toward the lower border of the lung on the right side. He should also recognize the tympanic modification from the stomach and the dull modification from the spleen toward the lower border of the left lung. At the back percussion should be made from above downward in the scapular lines on both sides. Toward the lower border on the right side normal resonance will be modified by the liver, while on the left side it will be modified by the spleen and left kidney.

Normal Percussion Sounds.—In the supraclavicular area there is moderate pulmonary resonance except toward the trachea, where it becomes tympanic. In the infraclavicular spaces there is typical pulmonary resonance with a tendency toward the tympanic quality as percussion is carried in over the large bronchial tubes. This tympanic quality is slightly more pronounced on the right than on the left because of the larger right bronchus. In the mammary spaces the pulmonary resonance is somewhat decreased, due to the mammary glands and pectoral muscles. In these areas, too, the sounds are modified toward the lower border of the right lung by the liver and over the precordial area on the left side by the heart. In the axillary spaces typical pulmonary resonance is heard, modified by the liver on the right side and by the stomach and spleen on the left side. The infrascapular spaces are less resonant than the infraclavicular spaces, but

they are the most resonant of any of the posterior areas. The suprascapular spaces and the interscapular spaces possess modified pulmonary resonance. The scapular areas overlaid by the scapulæ and heavy muscular structures are the least resonant of any lung areas.

Alteration in Position of Lung Borders.—It is evident that any abnormal condition which increases the expansion of the lungs correspondingly extends the lung borders. It is equally true that any abnormality which limits pulmonary expansion retracts the lung borders. This variation may be detected through percussion. A general increase of expansion and the consequent extension of lung borders is characteristic of hypertrophic emphysema. It is also found in the paroxysms of bronchial asthma and in the dyspnoea of uncompensated heart disorders.

Increased resonance at the apexes is present in bronchial asthma and whooping cough. Decreased resonance at the apexes is characteristic of phthisis, bronchial obstruction, pneumonia at the apex and adhesions of the pleura.

Extended resonance of the anterior borders is present in hypertrophic emphysema. Also during bronchial asthma and whooping cough. Often the extension of the anterior border of one lung is due to the compensatory increase of that lung. Decreased resonance at the anterior border may result from cardiac hypertrophy, pericardial effusion, pleural effusion, fibroid phthisis, interstitial pneumonia.

Extension of the lower border is associated with hypertrophic emphysema and occasionally from pericardial effusion, which depresses the diaphragm. It should here be remembered that the lower borders of the lungs lie approximately one inch lower in old age than in adult life. It is equally important to remember that in childhood the lower border is approximately one inch higher than in adult life. Further, if the patient is in the horizontal position the lower border of the lung lies one inch lower because of the tendency of the heavy abdominal viscera to depress the diaphragm and

to pull the lungs down into the complementary space. Decreased resonance at the lower border indicates chronic interstitial pneumonia, fibroid phthisis, paralysis of the diaphragm, abdominal tumor or subphrenic abscess. Pleural effusion also leads to a raising of the lower border of the lung.

Decreased Resonance.—It is obvious that since normal pulmonary resonance results from a normal amount of air under the surface percussed, a decreased resonance indicates that there is less than the normal amount of air. The diagnostic significance is, therefore, variable. Some of the conditions which are indicated by this decrease of resonance are the consolidation of pneumonia, fibroid phthisis, abscess, tumor, pleural thickening, infarction, atelectasis, hydrothorax, hemothorax and pneumothorax. Because of the variety of conditions which decreased resonance indicates it is desirable to consider such decreased resonance in respect to its position in the lungs.

Decreased resonance at the apexes is primarily indicative of phthisis, although one should not lose sight of the possibility of apical pneumonia, tumor or atelectasis.

Decreased resonance of the lower lobes suggests pneumonia, pleural effusion, atelectasis, infarction, neoplasms or abscess.

Pleural effusion in the left pleura is usually first observed in a triangular shaped area called Traube's area. This lies in the left hypochondriac region between the sixth and eighth ribs and is the area which is usually tympanic. When fluid is in the left pleura it becomes dull.

Extensive fibroid changes associated with chronic interstitial pneumonia and fibroid phthisis give rise to a characteristic "wooden" percussion note.

Dullness in the left interscapular area is often significant of aortic aneurism. Dullness in both interscapular areas is significant of partial lung collapse or enlarged bronchial glands.

Dullness at the base of the lungs which changes readily

as the patient changes posture is characteristic of hydro-pneumothorax.

Increased Resonance.—In the main it may be said that increased resonance is significant of an increase in the amount of air under the surface percussed. Thus we find the resonance increased in hypertrophic emphysema. There is also an increased resonance over lung cavities which changes to dullness if the cavities fill with fluid. Increased resonance is also significant of pneumothorax, providing the air is not under too great tension. If the tension is great the percussion note actually becomes dull. A solid neoplasm or a solid shaft of consolidation between the surface and a large bronchial tube or deep cavity leads to an increased resonance because of the ready transmission of the air vibrations in the cavity to the surface.

A strongly resonant note is found in hypertrophic emphysema. This may be unilateral or bilateral. If it is unilateral it is compensatory.

Hyperresonance in the upper lung associated with dullness at the bases is significant of pleural effusion, basal pneumonia, pulmonary edema. Hyperresonance in the infra-clavicular region near the sternum, which is associated with dullness at the apexes, is significant of consolidation from the surface to the trachea or large bronchi.

Cavities in the lung produce a localized tympany. They are significant of phthisis, bronchiectasis and the latter stages of gangrene and abscess.

Amphoric (metallic) resonance is tympanic in quality, but higher in pitch and greater in duration than is the usual form of tympany. It is indicative of a reasonably large, smooth-walled cavity in the lung or to pneumothorax.

The cracked pot sound is tympanic in character but possesses an overtone of a rather hissing quality. It is best noted with the patient's mouth open and during expiration. It is the result of air passing from a cavity into the bronchial tubes. When it is observed at the apexes it is significant of

a lung cavity communicating with a large bronchus. If it is at the base of the lung it usually indicates pneumothorax with a communicating opening to the bronchi or to the external. This type of percussion note is best observed under strong percussion.

Coin percussion is used to detect pneumothorax. If a stethoscope is placed on the thoracic wall over the suspected area, and if two coins are employed over another part of the same area, one placed flat on the chest and the other used as a striker, the sound will be dull and flat if pneumothorax is not present. If pneumothorax is present the sound will be heard as a far away tinkle.

Auscultation

There are three important channels of investigation through auscultation of the lungs. The first of these is to determine the character of the breath sounds. The second is to determine the character of the voice sounds and the third is to discover adventitious sounds, which include rales, succussion sounds and friction sounds.

Before proceeding with the auscultation the patient should be disrobed sufficiently to permit the placing of the stethoscope directly on the skin over the areas to be examined. The intervention of clothing is at all times to be avoided, particularly in lung examinations. It is sometimes difficult to detect slight shades of difference in the sounds and the judgment should not be made more difficult by the friction of intervening clothing. It is desirable that the patient be in the upright position, but if this is impractical the examiner must make the best of the situation. The patient should be instructed to breathe regularly and deeply, as some varieties of abnormal sounds are heard only upon deep respiration.

Normal Breath Sounds.—In order to understand the significance of breath sounds it is first necessary to explain what produces them. As the air passes through the comparatively

narrow opening between the vocal cords it is set in vibration. This vibration is not sufficient in ordinary breathing to produce sound which can be readily heard. By placing the stethoscope directly over the larynx, however, it is easily detected. It is the passage of this air through the larynx and the consequent vibration of the column of air in the trachea and bronchial tubes which is the source of the breath sound.

There are three varieties of normal breath sounds. They are the bronchial, vesicular, and broncho-vesicular.

Bronchial Breathing.—Bronchial breathing is normally heard in the region immediately over the trachea and larger bronchial tubes. It is heard at the anterior from the larynx downward to cover the upper half of the manubrium. At the posterior it is heard as far down as the lowest cervical. This sound is heard throughout inspiration and expiration with a slight pause immediately before the completion of the inspiratory act. These inspiratory and expiratory sounds are of approximately the same length, with the sound of inspiration slightly shorter and the two in the ratio of five to six. This sound is usually described as of a blowing or tubular character and it is readily heard in the locations designated because of the proximity of the trachea and large bronchi to the surface. Practical experience with normal patients is the only way one can become familiar with the characteristics of this bronchial sound.

Vesicular Breathing.—The vesicular breath sound is so named from the fact that it is heard in those portions of the chest under which the pulmonary vesicles lie. It is a much softer, more breezy sound than is the bronchial sound. It is often described as being comparable to a gentle rustling of leaves in a gentle breeze. This sound is heard throughout all of inspiration but is heard only during one-third of expiration. This sound has largely the same origin as the bronchial sound, but it is transmitted a much greater distance and through tissue of varying tension. Thus the sound appears muffled or far away and is less intense. It is possible

that a part of the sound known as vesicular breathing arises from the entrance and exit of air to and from the vesicles.

Broncho-Vesicular Breathing.—There is no hard and fast line where the change is suddenly made from bronchial breathing to vesicular breathing. There is a limited area of possibly one inch in width at the sides of the sternum and the spine where the character of the sound partakes of both the bronchial and vesicular qualities. At the anterior this extends down to the angle of Louis, while at the posterior it extends to about the fourth dorsal vertebra. It is here that the large bronchi are overlayed with a thin edge of lung vesicles and thus the bronchial sound must be transmitted through this thin, spongy, vesicular tissue. It is for this reason that the sound is neither typically bronchial nor typically vesicular, but is a combination of both.

Abnormal Bronchial Sounds.—In order to understand and properly interpret abnormal breath sounds it is necessary to become familiar with the normal sounds as outlined above. Abnormal breath sounds are established when bronchial or broncho-vesicular breathing is heard where vesicular breathing should exist and in those cases where vesicular breathing is absent or decreased or increased. The significance of these sounds should become a matter of reason. The basis for the reasoning being a knowledge of lung structure and a knowledge of what causes normal breath sounds.

Bronchial Breathing.—When bronchial breathing is found over an area where vesicular breathing should prevail it signifies that some condition exists which more perfectly transmits the breath sounds from the trachea and large bronchi to the surface. The most common cause of such breathing is consolidation of some character which reaches from the surface to the large bronchi, and the extent over which the bronchial breathing is heard determines the extent of the consolidation which lies under the surface. If this consolidation extends into the large bronchi it is of low pitch, while if it extends into small bronchi it is of high pitch. If bronchial

breathing is found at the apex of the lung it is usually significant of tuberculosis. It may, however, indicate apical pneumonia, gangrene, abscess, adhesions, infarctions, tumor. If this type of breathing is found at the base of the lung it is most often significant of pneumonia or fibroid phthisis.

Large pleural effusions sufficiently extensive to compress the lung and make it a potential solid body around the bronchi give rise to "distant" bronchial breathing.

Amphoric breathing is significant of a superficial cavity opening into a reasonably large bronchial tube or a pneumothorax opening into a large bronchial tube. This type of breathing has a peculiar musical note and is comparable to the sounds made when blowing across the large neck of a bottle.

Sudden cessation of bronchial breathing where it has been present is due to a plugging of the bronchi with which the consolidated area communicates.

Vesicular Breathing.—Vesicular breathing in old age is normally decreased. This is due to the loss of tone in the lung tissue and its decreased ability to transmit vibrations. If the vesicular breathing in adults or children is decreased it may be due to an excessively thick chest wall, thickened pleura, small pleural effusion, emphysema, obstructed bronchus or a pneumothorax whose communication with the bronchus has been cut off.

Increased vesicular breathing is normal in infants and early childhood. It is undoubtedly due to the greater tone which the lung tissue possesses at this age. Care should be taken to avoid confusing an increased vesicular sound with a bronchial or broncho-vesicular sound. The distinction can be made by noting the timing. Even in an increased vesicular sound the ratio of inspiration and expiration is three to one. In adults, if the vesicular breath sound is increased, it is significant of increased respiratory effort. If found over one lung only it is compensatory to deficient expansion in the other lung. If heard over both lungs it is significant of dyspnoea.

Normal Voice Sounds.—Vocal resonance is detected through the use of the stethoscope over various regions of the thorax. The voice sounds are conducted from the larynx downward through the air columns of the trachea and bronchial tubes to the air vesicles and thence to the surface through the thoracic wall. If the patient is asked to speak the sound which is thus heard through the stethoscope is of a characteristic buzzing quality, but it is impossible to distinguish the articulation. The farther the stethoscope is placed from the trachea the less distinct is this vocal resonance. It is obvious then that the use of the stethoscope to determine the voice sounds is for the purpose of determining the carrying ability of the structures between the larynx and the surface where the stethoscope is placed.

Decreased Vocal Resonance.—This condition is significant of a plugged bronchus, pleural effusion, pneumothorax or thickened pleura.

Increased Vocal Resonance indicates some form of consolidation between the surface where it is detected and a large bronchial tube. These conditions include fibroid phthisis, pneumonia, tumor, abscess, gangrene, infarction. Increased resonance may also result from a cavity close under the surface communicating with a large bronchus.

If the spoken word becomes articulate it signifies **pectoriloquy**. This is a condition wherein the transmitting medium conveys the vocal sounds to the surface with a marked degree of perfection. Whispering pectoriloquy is a condition wherein the whispered word can be distinguished. This indicates perfect conductivity from the trachea or large bronchi to the surface.

Adventitious Sounds.—Adventitious sounds are abnormal sounds and are divided into three groups. These are rales, succussion sounds and friction sounds.

Rales.—The whole subject of rales can be greatly simplified if we understand their origin. The normal sounds which are heard during breathing are the breath sounds. In

certain pathological conditions, however, blood, mucus or other substance may lie in the bronchial tubes and vibrate as the air enters or leaves these tubes. This vibration gives rise to sounds which are known as rales. They are classified in two main divisions. First, the dry rales; second, the moist rales. They are designated as large or small, dependent upon whether they arise from the large tubes and vibrate slowly or from the small tubes and vibrate rapidly.

Dry rales are produced by the passage of air through partly occluded bronchial tubes. This occlusion may be the result of congestion or the accumulation of stringy, viscid mucus. If heard toward the end of inspiration and if having a high pitch it is obvious that they arise from the small bronchial tube and they are known as sibilant or small rales. If they are heard during both inspiration and expiration and if they are of a low pitch they arise from the larger tubes and are known as sonorous or large rales. Dry rales are found in the early stages of bronchitis and during the spasm of bronchial asthma.

Crepitant rales are heard at the end of a deep inspiration and may be simulated by softly crumpling a piece of delicate tissue paper. These rales are produced by the sudden expansion of the pulmonary alveoli at the end of inspiration. They are significant of the early stages of pneumonia and are also present with edema, infarction and atelectasis. Ofttimes the crepitant rale also arises as the result of friction between the two layers of the pleura. It is a moist rale.

Subcrepitant rales (small moist rales) are heard during both inspiration and expiration and arise from the presence of fluid in the small bronchial tubes. They are heard at the margin of consolidations. They are also heard in the latter stages of pneumonia and at the apexes of the lungs in the early stages of phthisis.

Coarse rales (mucous rales) may be heard both during inspiration and expiration. They arise from the large bronchial tube and are the result of air passing through fluid in

these tubes. They are significant of the softening stage of tuberculosis and are also heard in bronchitis with extensive effusion.

Succussion Sounds.—Succussion sounds are splashing sounds which are heard as the body is shaken from side to side. This sound is significant of hydropneumothorax, but it should not be confused with the splashing sounds which may arise from the abdominal cavity.

Friction Sounds.—Friction sounds are variable in character, depending on their source. They result from actual friction between the layers of the pleura or those of the pericardium. They are usually associated with pain and are particularly in evidence during the early stages of pleurisy and pericarditis.

SECTION 6

EXAMINATION OF THE ABDOMEN

BY DR. A. G. HINRICHS

In our discussion of the abdomen and its examination it is assumed that the student is thoroughly familiar with the anatomy of this region.

The abdomen is divided into areas either nine in number or four in number, depending upon the preference of the examiner. The nine areas are achieved by four lines, two horizontal and two vertical. The upper horizontal line is drawn from the lowermost margin of the tenth rib. The lower horizontal line is drawn from the anterior superior spines of the ilii. The two vertical lines pass through the middle of Poupart's ligament. Thus, named from left to right and starting with the upper tier we have—the left hypochondriac, the epigastric, the right hypochondriac; the left lumbar, the umbilical, the right lumbar; the left inguinal (iliac), pubic and right inguinal (iliac). The more simple method of division is by two lines. One vertical, one horizontal and both passing through the umbilicus. Thus the abdomen is divided into the right upper, left upper, right lower and left lower regions.

Abdominal Inspection.—Abdominal inspection should, as a rule, be made with the patient in the recumbent posture. If the examiner is doing bedside work all quilts and blankets should be folded down to the pubic region. The night clothing should then be raised to the lower end of the sternum. Where practicable inspection should be made from the front, sides and back in order to detect pendulosity, bulgings, re-

traction, pulsations, condition of skin, respiratory movement and possible distention of blood vessels.

If the skin is smooth, shiny and taut it is indicative of internal abdominal tension. White streaks in the abdominal wall, on the buttocks and thighs are indicative of long continued abdominal distention from pregnancy, tumor, ascites or other unusual conditions. In pregnancy deep pigmentation, usually in the linea alba, is common. Circular, scaly copper-colored spots are characteristic of syphilis. Enlargement or scar tissue in the groin is indicative of present or past venereal disease.

General enlargement of the abdominal veins is significant of interference with abdominal drainage resulting from direct pressure upon important abdominal veins. A series of enlarged veins radiating from the umbilicus is particularly significant of portal obstruction. It is obvious that the umbilicus will be depressed in obese patients, while it will be shallow and flattened in those patients with abdominal distention.

It should be remembered that the abdominal type of breathing is more prevalent in men and in children, while it is less apparent in women. If abdominal breathing is decreased it indicates partial or complete immobility of the diaphragm. Reason dictates that this may result from any abdominal abnormality which would lead to pain upon abdominal compression. Such would be the case in peritonitis, appendicitis, subphrenic abscess, ovaritis, etc. The action of the diaphragm may be interfered with mechanically by enlargement of any of the abdominal viscera or accumulation of gas or fluid in the abdomen.

Abdominal Palpation and Percussion.—Different patients are differently susceptible in their reactions to pain. Therefore, it is well to give attention to the facial expression in making abdominal palpations rather than to accept the word of the patient as to its character or the severity of its sensation. If malingering is suspected the attention of the patient should be diverted and a thorough test thus made as

to the actual presence of tenderness. In severe cases where the abdominal muscles are contracted investigation by palpation can be promoted by having the patient flex the thighs and perhaps by raising the head and shoulders on pillows.

The palpation should be made with the warm hand placed flat on the abdomen and by employing a circular movement with gradually increasing pressure. The examiner should not make the error of poking with the finger tips. Such a procedure leads to resistance by the patient. On the contrary a dipping should be made with the balls of the fingers after a reasonably firm pressure with the entire palm of the hand has been established. Sometimes it is advantageous on deep palpation to reinforce the palpating hand with its fellow. In palpating in the lumbar region one hand should be placed between the lowermost rib and the crest of the ilium at the posterior while the other hand is employed in exploration. Palpation is of value in determining the enlargement of abdominal organs, displacement of these organs and tenderness.

Abdominal percussion is of very doubtful value. It does serve to determine the surface borders of the liver, the spleen and the upper limits of the stomach. Beyond this point it is chiefly of value in detecting the presence of solid masses in the abdomen. With the exception of the areas over the liver and the spleen the abdomen is normally tympanic, while if dullness is discovered it is significant of solid, airless material. This may be fluid, tissue or fecal material.

Abnormal Abdominal Findings.—An increased thickness of the abdominal wall is due to either fat or edema. These can readily be distinguished by noting whether or not the surface pits on pressure. If the abdominal wall is thin and wrinkled it may be due to a wasting disease or may be the result of a long-standing tension brought about by abdominal distention.

Rigid abdominal muscles if bilateral are significant of peritoneal inflammation, intraabdominal hemorrhage, perforation of abdominal viscera or to some form of thoracic

inflammation which renders diaphragmatic movement painful. If only the right rectus muscle is contracted it is usually indicative of appendicitis.

General distention of the abdomen has four causes. First, fat in the abdominal wall; second, fluid in the abdominal cavity; third, gas in the peritoneal cavity or in some abdominal organ; fourth, a large abdominal tumor.

If the condition is due to fat in the abdominal wall it is observed that this heavy, thick wall can be gathered up in folds in the hand and the great thickness thereby demonstrated. It is also observed that when the patient lies in the recumbent posture the anterior wall of the abdomen flattens somewhat and the side walls bulge. This condition is usually associated with a greater or less accumulation of fat in other parts of the body, notably the buttocks and thighs.

If fluid is contained in the peritoneal cavity it is found that when the patient assumes the recumbent posture the abdomen flattens anteriorly and bulges laterally. In this position normal tympanic sound is elicited upon percussion in the middle of the abdomen but dullness is demonstrated at the sides. This is because the air-containing intestine seeks the highest level while the free fluid seeks the lowest level in the abdomen. If the patient is turned on the side it will be discovered that the upper side now shows tympanicity whereas it formerly showed dullness upon percussion. If only a small amount of fluid in the peritoneal cavity is suspected the patient should be required to assume a knee-chest position when it will be found that dullness is in evidence on the anterior abdominal wall. An estimate as to the quantity of fluid can be obtained by having the patient in the recumbent posture and directing an assistant to place the ulnar surface of the hand and forearm parallel to the linea alba and press firmly downward. If the examiner then places one hand on the left side of the abdomen and percusses with the other hand on the opposite side a distinct transmission of the percussion stroke is noted by the palpating hand if a large quan-

tity of fluid is present. To determine whether the fluid contained lies in the peritoneal cavity or is limited by an organ such as the bladder, the ovary or the uterus it should be determined whether its position fluctuates. This can be determined as stated above by directing the patient to turn from side to side while percussion is made.

Gas in the stomach and intestine may be present in sufficient quantity to produce excessive abdominal distention. Such gas distention is always within the alimentary tract unless perforation has been made which permits its escape into the peritoneal cavity. If such perforation and escape is suspected the patient should be directed to lie on the left side while percussion is made over the region where right hepatic dullness is normally found. In this position such dullness will have disappeared but will again be demonstrated when the patient assumes the recumbent posture. Large accumulations of gas in the stomach and intestine are found in some cases of hysteria and are also demonstrated where obstruction of the intestinal canal develops.

Tumors of the abdomen, if of large size, result in general distention of the abdomen. Palpation reveals their size, shape, location, mobility and character. In palpating for tumor it should be observed whether the tumor is extra-abdominal or intra-abdominal. If extra-abdominal it can be readily grasped in one or both hands as a part of the abdominal wall, while if it is intra-abdominal it escapes when the abdominal wall is gathered into a fold. It should be determined whether the tumor is freely movable or fixed, the direction in which it moves and whether or not it moves with respiration. If it moves with respiration it is usually attached to some organ in close proximity to the diaphragm. The direction in which it moves freely determines, in large part, to what organ it is attached. Thus a floating kidney is readily moved upward and backward. The character of the tumor cannot be determined by palpation except in a very general way. Examination may distinguish between a cystic

tumor and a solid tumor but cannot determine whether it is benign or malignant. It should be remembered that malignant tumors almost invariably terminate fatally within eighteen months and the duration for a period of several years excludes the malignant consideration. Immovable abdominal tumors are those of the pancreas and aneurysms of the aorta. The latter of course will be found to pulsate rhythmically.

Examination of the Stomach.—Physical examination of the stomach is for the purpose chiefly of determining its size and position although it is of additional value in demonstrating gastritis, ulcer and cancer. Inspection, palpation, percussion and auscultation are all employed, yet auscultation has little value.

If the stomach is dilated, distention may be present in any of the abdominal regions except the epigastrium. This is because of the mobility of the organ. The usual appearance when the stomach is prolapsed is a flat or hollow appearance in the epigastric region, evident when the patient is recumbent and increased when the erect posture is assumed. When the position is thus changed there is visible distention usually in the umbilical region which is more apparent in the erect posture.

Palpation reveals tenderness over the entire inflamed area when gastritis is present. Gastric ulcer reveals a definitely localized tenderness almost always at the pylorus. Tumor at the pylorus in elderly people is almost invariably cancer. It may be immobile or mobile, depending upon whether or not adhesions have formed.

Percussion is valuable chiefly in determining the size and location of the stomach. It is obvious that the tympanic note detected in percussion over the stomach is impossible to distinguish from the tympanic note elicited over other abdominal regions. However, if the patient is required to drink several tumblers of water and if percussion is made immediately after the ingestion of each the dullness which is discovered

will designate the position of the stomach. By this method it can be determined whether the stomach occupies its normal position and has its normal size or whether it is prolapsed or dilated.

Auscultation is chiefly of value in detecting cardiac stenosis and gastric stasis. By placing the stethoscope over the stomach a distinct esophageal bruit is heard about seven or eight seconds after deglutition and this sound is followed in about five seconds by the sound of the food entering the stomach. In esophageal stenosis these sounds are not detected. In gastric stasis fermentation occurs in the stomach and this is evidenced by distinct crackling or sizzling sounds.

Examination of the Intestines.—Percussion and auscultation have a very limited and uncertain value in examining the intestines. The chief value of percussion lies in determining whether an enlargement is the result of gaseous distention or fecal impaction. It is obvious that other enlargements are of a chronic character and their duration should indicate their character. Palpation is of greatest value and its chief purpose is to detect the existence of unusual masses. Thus tumor in any part of the intestines may be palpated. The mobility and size will lend some information as to its attachment. Fecal accumulations are characterized by their boggy resistance.

Tenderness over the intestines is present in all forms of inflammation and in ulceration this tenderness is distinctly localized. Inflammation of the appendix is marked by tenderness over McBurney's point. Muscular rigidity of the abdomen is found in inflammation where the tenderness is marked.

Examination of the Liver.—Inspection, auscultation and percussion are used in liver examination. Of these percussion is most valuable. The purpose of liver examinations is to determine position, size, shape and character. Inspection will sometimes reveal the outline of the lower border of the liver and in case of enlargement may reveal protrusion

of the lower ribs in the right hypochondriac region. The chief value of auscultation is to detect the grating sound heard when a gall bladder containing gall stones is palpated.

Percussion is employed chiefly to determine the outline of the liver. Here auscultory percussion is most valuable. By placing the stethoscope at the approximate center of the evidenced liver dullness and by percussing outward in all directions the borders can be accurately outlined.

The gall bladder when empty is not palpable but if it is distended it is readily palpated under the lower margin in the gall bladder fissure. If filled with gall stones a somewhat grating character may be detected. The gall bladder is normally quite movable, but such mobility is decreased by adhesions.

Enlargement of the liver is indicative of hypertrophic cirrhosis, amyloid degeneration, abscess, cancer, gumma, fatty infiltration and congestion. Care should be taken that consolidation at the base of the lung or the accumulation of fluid in the pleura is not mistaken for liver enlargement. Such confusion may be eliminated by taking into account the associated symptoms. Also care should be exercised to avoid confusing a large fecal mass in the transverse colon with hepatic enlargement. This distinction can usually be made by detecting a narrow margin of tympanicity between the colon and the liver. Tumors below the liver may cause confusion. Auscultory percussion will determine whether they are attached to the liver or not.

Decrease in the size of the liver is characteristic of atrophic cirrhosis. Care should be taken, however, to see that intrusion of the lungs from above or of the tympanic intestine from below does not lead to a false conclusion.

Displacement of the liver toward the superior or inferior is the result of thoracic or abdominal abnormality. Thus hypertrophic emphysema will cause an inferior displacement. Large accumulations of fluid in the right pleura or in the pericardium have a like effect. On the other hand paralysis

of the right diaphragm leads to a superior displacement. Abdominal tumors or the accumulation of large quantities of gas or fluid in the abdomen lead to a superior displacement of the liver.

Under palpation the character of the exposed surface of the liver should be carefully noted. In cirrhosis, cancer, gumma and amyloid degeneration the liver appears to be hard and dense. In gall bladder enlargement, abscess or hydatid cyst the consistency is elastic and fluctuating. In fatty infiltration and amyloid degeneration the surface is smooth. In cirrhosis the surface is granular. In cancer nodules of varying size are evident often with a slight central depression. In syphilis the gumma are slightly elevated and smooth.

Examination of the Spleen.—Palpation is the method employed in examining the spleen. This organ cannot be palpated if of normal size and in its normal location. If enlarged or displaced it is palpable. Palpation should be made immediately under the tenth costal cartilage with the free hand pressing forward in the tenth interspace at the ends of the tenth and eleventh ribs. The spleen is thus tilted downward and forward. If enlarged its anterior surface can then be palpated and its transverse ridge readily detected. Under respiration this ridge can be felt to move with the diaphragm under the palpating hand. Often a distinct notch can be felt in this anterior ridge. When the spleen can be palpated in its approximate normal location a positive diagnosis of enlargement can be made except in cases of extreme emaciation. Acute enlargement is found in practically all febrile diseases. Chronic enlargement of the spleen occurs in leukemia and chronic malaria. In these conditions the spleen becomes extremely enlarged, sometimes filling almost the entire abdominal cavity. Distinction can be made between an enlarged spleen and a displaced kidney by noting the transverse ridge on the former and observing the mobility with respiration. A displaced kidney moves very slightly with respiration while an enlarged spleen moves over a wider field.

Examination of the Kidneys.—The only reliable method for examining the kidneys is palpation. The purpose of palpation is to determine the location and size of the kidney. It is most often the right kidney which is movable or floating. Distinction should here be made between these two terms. If a kidney can be displaced downward as far as the transverse umbilical line it is said to be movable. If, however, it can be displaced to the lower abdominal areas or across the median line it is said to be floating.

In making the palpation the patient should be in the recumbent posture with the shoulders and head raised, with the knees flexed to relax the abdominal muscles. The supporting hand should then be placed under the two lower ribs and the palpating hand at the anterior under the costal arch. Pressure should then be made and unless the abdominal wall is too thick the lower edge of the kidney can be palpated if it is of normal size and in normal position. If it is movable or floating, however, it can be displaced downward and readily slips under the palpating hand. It is quite possible in many cases to distinctly feel the entire outline of the organ. Enlargement of the kidney is present in hydronephrosis, pyonephrosis, tumors and chronic diffuse nephritis.

SECTION 7

THE ACUTE FEBRILE DISEASES

Bodily Temperature

Fever is a condition in which the bodily temperature is increased above normal and is attended by symptoms. The average normal bodily temperature is 98.6 degrees, yet normal temperatures have been known to vary between 99.5 and 97.2. The bodily temperature may be slightly increased by violent exercise in hot weather, mental exertion and excitement. The most important change in normal temperature is that which occurs daily. Under normal conditions the bodily temperature is lowest in the morning about 6 A. M. and highest in the evening between 6 and 8 P. M. Daily variation is usually restricted to one degree, but the greatest difference considered compatible with health is 1.8 degrees.

There is a slight variation in the temperature of the body according to the location at which it is taken. The normal temperature in the axilla or groin is 98.4, mouth 98.6, rectum or vagina 99.5.

A temperature between 99 and 100 degrees is spoken of as feverishness; a temperature between 100 and 101 as slight fever, 101 to 103 moderate fever, a temperature between 104 and 105 as high fever; a fever of 106 or over is called hyperpyrexia. A fever is said to have three periods or stages—the first stage is known as the invasion or initial stage, during which time the temperature gradually rises; the second stage is called the adult stage, during which the fever reaches its height, and during which the cardinal symptoms of the disease producing the fever will be manifest; the third stage is known as the decline or the sweat period, during which the temperature gradually drops until it becomes normal.

Fever may decline suddenly or gradually. When the temperature falls gradually the fever is said to terminate by lysis, as in typhoid, scarlatina and bronchial pneumonia. When the temperature drops suddenly and is attended by profuse sweating the fever is said to terminate by crisis as in pneumonia, measles and malaria.

Subnormal Temperature.—When the bodily temperature drops below 98 degrees the temperature is said to be subnormal. It is of common occurrence immediately after the fall of fever by crisis, and is also observed in shock and collapse. A subnormal morning temperature with a persistent rise during the afternoon is highly suggestive of tuberculosis. In valvular disease of the heart, myxedema, diabetes, cancer and epilepsy, a moderate per cent of the cases will show subnormal temperatures.

Care of Febrile Cases.—All cases of fever should be placed in bed. The room should be moderately warm, quiet and well ventilated. The body should be sponged and kept clean at all times to permit the skin to function. Remember the skin is an important organ of elimination, and furthermore, 80 per cent of the heat dissipated from the body is given off through the skin. The dissipation of heat is much greater during perspiration. The patient should be nourished, as needed, with milk, animal broths and other nutritious foods in small quantities, but at regular intervals. At no time should solids be indicated. The patient should be provided with plenty of fresh, pure, cold water and orangeade or lemonade may be given in liberal quantities. Orange juice and lemon juice are both nourishing and cleansing, and in addition they tend to neutralize acid excretions which are always increased during fever. The patient should be adjusted according to the spinal findings from one to four times per day, depending upon the nature of the case. The frequency of the adjustment must be determined by the chiropractor, and his judgment will naturally be guided by his former teaching and past experiences.

The incubation period varies greatly in the various diseases. The following table gives the average time that elapses between the exposure and development of symptoms:

Anthrax	2 days
Bubonic plague	4 to 6 days
Chancre (soft)	1 to 2 days
Diphtheria	2 days
Erysipelas	4 to 6 days
Gonorrhea	3 to 5 days
Hydrophobia	20 to 60 days
Influenza	3 to 4 days
Malaria	6 to 10 days
Measles	9 days
Mumps	15 days
Recurrent fever	5 to 6 days
Rubella	18 days
Scarlatina	2 to 5 days
Smallpox	12 days
Syphilis	20 to 30 days
Tetanus	2 to 3 days
Typhoid fever	14 days
Typhus	21 days
Vaccinia	3 days
Varicella	14 to 15 days
Whooping cough	8 days
Yellow fever	3 to 4 days

A fever is a condition in which there is a rise in the bodily temperature above normal and it occurs when there is a disturbance in the normal relation between heat production and heat dissipation, caused by C. P. and K. P. subluxations. The symptoms of a simple fever are a hot, dry skin, flushed face, dry mouth with excessive thirst, malaise, lassitude and languor, anorexia, nausea and vomiting, costiveness of the bowels, scanty high-colored urine, headache and backache, increased pulse rate, and frequency of respiration. In

case of a high fever, there may be cerebral symptoms of delirium, stupor and coma, and a suppression of the bodily secretions. As a rule, the pulse rate is increased 10 beats per minute, to a rise of one degree in the temperature and a corresponding increase in the respiratory rate, but there are exceptions to this rule.

The daily decrease in the temperature is known as the **remission**, and occurs in the morning, while the increase is known as the **exacerbation**, and occurs in the evening. When this order is reversed the fever is said to be of the **inverse** type. Any temperature below 97.2 degrees is said to be **sub-normal**, while a temperature above 106 degrees is called **hyperpyrexia**, or excessively high fever, and is a grave symptom.

Types of Fever

A **continued** fever is one in which the daily difference between the remission and the exacerbation is less than two degrees.

A **remittent** fever is one in which the daily difference between the remission and the exacerbation is more than two degrees, but at no time is the temperature within the normal range.

An **intermittent** fever is one whose temperature reaches the normal or is subnormal at least once during 24 hours duration.

The continued fever is most common, and is found in the majority of the acute febrile diseases, such as typhoid, typhus, lobar pneumonia, actue tuberculosis and erysipelas.

Remittent fever is seen in tuberculosis, abscess, or any disease in which there is suppuration, although oftentimes in suppuration the fever is intermittent.

Intermittent fever is seen in intermittent malaria, pyemia, abscesses, ulcerative endocarditis and tuberculosis. It is not uncommon to see more than one type of fever in a single case, as in tuberculosis or abscess, in which, at times,

the fever is remittent and at other times is intermittent. Intermittent fever has recurrent chills, fever and sweats.

A fever that returns several days after its disappearance is said to be a recurrent or relapsing fever, while one in which there is no regular variation in its remissions or intermissions is said to be an irregular fever. Dengue and relapsing fever have a recurrent fever, and pyemia has a typical irregular fever.

Reportable Diseases

The list of reportable diseases varies somewhat in different states. The Chiropractor should inform himself on the reportable diseases by securing from the Secretary of the State Board of Health a synopsis of the health laws, and a list of the reportable diseases. In most states the practitioner is required to report the following diseases: acute infantile paralysis, diphtheria, cerebrospinal meningitis, pink eye, hook worm disease, leprosy, measles, mumps, influenza, German measles, scarlatina, smallpox, trachoma, typhoid, paratyphoid, typhus, chicken pox, whooping cough, and erysipelas. Several states now require a report of all venereal diseases either by name or by number, and require the practitioner to instruct the patient, and give him educational literature bearing upon his disease and the legal requirements. It is important that the Chiropractor inform himself on these legal requirements and cooperate with health authorities.

Prognosis

Prognosis is a forecast of the probable course and termination of a disease. The course and termination of a disease depend upon its nature, its degree of severity, the vitality of the subject, age, recuperative power and numerous other factors. The prognosis of a given case may differ materially from that of another case suffering from the same disease. The practitioner must be well informed in a knowledge of the

human body in health and disease, and especially well informed on the structural changes existing before he is competent to render a reasonable prognosis. No matter what the age of the patient, nor how great the vitality or recuperative power, a good prognosis could not be expected where great destruction of tissue has been brought about by disease. When disease produces destruction, nature brings about certain reparation, usually by means of connective tissue. A scar is an example of nature's method of repairing a deep cut through the skin. This scar cannot be removed and normal healthy skin developed in its place. When digits have been amputated by dry gangrene there is no method capable of replacing them. Several diseases of the nervous system have destructive changes in the nerve tissue, wherein it is replaced by connective tissue. The prognosis in these cases may be good so far as life is concerned, but highly unfavorable so far as recovery is concerned. An injury to the eye in early childhood, such as gonorrheal conjunctivitis, may lead to corneal ulcers and ultimately to panophthalmitis, which destroys the entire eyeball. The diseased organ ultimately becomes a mass of scar tissue, deformed in shape and color and rendered totally functionless. The patient may live to reach old age, yet there is no possibility whatever of restoring vision to the affected organ. Before undertaking the task of prognosing the case make a careful and thorough examination and ascertain the general physical condition of the patient, the damage produced by the disease, the nature of the disease, and weigh these facts carefully with the other facts upon which prognosis depends. With good judgment and a thorough knowledge of the structure and function of the human body in health and disease it is reasonable to presume a fairly accurate prognosis.

Typhoid Fever

Definition.—Typhoid fever is also known as enteric fever, abdominal typhus and autumnal fever. It is an acute febrile

disease characterized by a general fever and a localized ulcerative inflammation of Peyer's patches of the small intestine.

Adjustment.—The specific adjustment in case of typhoid fever is C. P. or fifth dorsal, K. P. or eleventh dorsal, and upper lumbar, usually the second lumbar vertebra. The adjustment of the fifth dorsal vertebra affects the thermogenetic subsidiary centers, and especially those of the liver, thus decreasing the amount of heat production. The adjustment of the eleventh dorsal vertebra affects the thermolytic subsidiary centers, thus increasing the heat dissipation via the skin and kidneys, while the adjustment of the second lumbar vertebra affects the local pathological condition of the small intestine, restoring normal function to its parts, which effects its restoration to normal structure.

Pathology.—During the initial stage there is a swelling of the mucous membrane of the small intestine, and especially of the solitary glands. Peyer's patches become greatly enlarged, whitened and raised above the surface of the mucous membrane of the intestine. The blood vessels of the intestinal mucosa are congested and an exudation soon follows. This exudate soon becomes purulent in character because of the necrosis that rapidly ensues. During this stage portions of the glands slough off, leaving deep ulcers at their former sites. During the stage of cicatrization the connective tissue cells in the floor of the ulcers begin to proliferate, thus forming scar tissue, which contracts, obliterating the former ulcer.

If the amount of destruction in the intestinal walls is great, the scars formed may interfere with the descent of the feces and obstructive constipation will be the result. Sometimes during the ulcerative stage perforation may occur, with the symptoms of shock or collapse.

Symptoms.—Typhoid fever begins slowly, with prodromal symptoms of headache, malaise, anorexia, nausea and vomiting, cough, epistaxis and chilliness, but no real rigors; there is pain and aching in the region of the spine, especially over

the kidneys, and usually constipation early in the disease, which may turn to diarrhœa later.

During the first week the fever gradually rises, the evening exacerbation increasing each day until the seventh or eighth day the temperature has reached 104 or 105 degrees.

During the second and third weeks the fever remains high, is of the continued type with slight morning remissions of from one to one and one-half degrees. The remission may occur in the evening and the exacerbation in the morning; it is then spoken of as the inverse type of fever, but is of no clinical importance. Varying from the sixth to the twelfth day of the disease there is the appearance of a rose rash upon the abdomen. This rash consists of macules 2 to 4 mm. in diameter, of a deep red color, which will disappear upon pressure but immediately become red as soon as the pressure is removed. These spots number less than twenty, are usually confined to the abdomen, and remain present for about five days, leaving a yellowish-brown spot upon disappearing. Very frequently there is a bronchial cough with slight expectoration, moist rales and rapid, shallow respirations. The pulse rate is accelerated, but usually not to the extent that might be expected from the height of the fever. It may be irregular in beat, weak and dicrotic when the fever is very high.

Diarrhœa is the most constant intestinal symptom, and usually appears during the stage of necrosis, which is toward the latter part of the second week. The stools are purulent in character, containing pus, necrosed epithelium and glandular tissue. The abdomen is greatly distended by tympanites, and there is great tenderness over the right inguinal region in the right illiac fossa. The spleen is also greatly enlarged and may be tender, but this enlargement is entirely adaptive, as the amount of destructive metabolism in a disease with high fever is very great, and the toxins thus formed have a deleterious effect upon the body. The white blood corpuscles are actively engaged in suppressing this effect, and in order to increase their number the splenic activity is ac-

cordingly increased and a consequent enlargement results. Further, the metabolic breakdown material, and especially the exhausted red cells, are taken up by the spleen, where they undergo disintegration and the hemoglobin is liberated, passes to the liver, where it is utilized in the formation of the bile pigment. This is why splenic enlargement is present in all fevers.

Other symptoms that frequently occur in typhoid are sudamina and urticaria during the eruptive stage, with peeling of the skin during convalescence. Scanty, high-colored urine, flushed cheeks, dilated pupils, sordes on the teeth, and a heavily-coated tongue with a deep longitudinal fissure having small fissures radiating from it are conditions usually present.

Under medical treatment typhoid may assume different forms, but this is accounted for Chiropractically by the fact that the degree of pressure upon the nerves may vary, thus producing a variation in the external manifestations or symptoms.

The several forms of typhoid are noted. The ordinary or moderate form is the most common, and has symptoms as described in the preceding pages. Its usual duration is 28 days, but the case may run 42 or 56 days. The grave or severe form has a temperature, usually amounting to hyperpyrexia with symptoms of the typhoid status. Most cases of this form are fatal. The mild form is characterized by a slight fever rarely exceeding 103 degrees, slight diarrhoea, and few nervous symptoms of a mild type. Abortive typhoid has a rapid onset, beginning with a chill, sudden rise in temperature, with marked symptoms common to the moderate form. The temperature falls by crisis during the latter part of the second week in this form and a rapid convalescence follows. Latent or walking typhoid is characterized by slight fever, languor, anorexia, emaciation, diarrhoea, a few rose spots, and there may be sudden death from intestinal perforation. In any form if the temperature should suddenly drop to 95 degrees or below, an internal hemorrhage has occurred, and will

be accompanied with the symptoms of collapse. The Widal test is used in making a positive diagnosis of typhoid.

Under Chiropractic adjustments the disease does not run its regular course of 28 days, and, in fact, if the adjustment is given in time recovery is so rapid that often the affection would not be recognized as typhoid 24 hours after it has been given. The common complications are intestinal hemorrhage, perforation, peritonitis, pneumonia, and ulceration of the tongue, while the sequelæ consists of various forms of paralysis, insanity, nephritis, alopecia, tuberculosis, and frequently aphonia. But even the sequelæ yield to the adjustments. We have a good example on record of a boy with aphonia, whose voice was restored to normal in five weeks' adjustments.

Differential Symptoms.—Typhoid may be distinguished from cerebro-spinal meningitis by the sudden onset of the latter, marked cerebral symptoms from the beginning. Kernig's sign, and the absence of abdominal tenderness and diarrhoea. Opisthotonus is common in meningitis and absent in typhoid. The eruption of typhoid occurs during the second week and appears on the abdomen, while the rash of cerebro-spinal meningitis appears between the first and fifth days and soon becomes petechial in character.

Peritonitis resembles typhoid only in its abdominal symptoms—the respiration, courses of fever, and Hippocratic countenance in the former will furnish a marked distinction between the two. Concealed suppuration or abdominal abscess will be differentiated by the irregular fever and the presence of leukocytosis.

The second lumbar subluxation impinges the nerves leading to Peyer's patches of the small intestine, thus diminishing the nerve supply (mental impulses), the result being abnormal expression of function or abnormal metabolism in this part of the intestine. Wherever there is abnormal expression of function there is the formation and accumulation of waste products and poisons. These waste products which have accumulated in the tissues of this part of the intestine form

fertile soil for the growth and development of these minute unicellular plants. They, having life, must express the manifestations of life, such as growth, reproduction, excretion, etc. These excretions, together with other poisonous products of abnormal metabolism, are absorbed by the fluid circulation in the body, and if the kidneys are then also functioning abnormally and are unable to eliminate all of this excretory material the foregoing symptoms will develop. If the subluxation of the second lumbar vertebra is properly adjusted, the vertebra assuming its proper alignment, the expression of the mental impulse will be normal in the intestine, no waste will be accumulated, therefore no soil will be present for the growth and development of plant life, and plants will not be able to exist upon healthy, living cells. This brief explanation will also hold true for all other acute, febrile, so-called infectious diseases, hence space will not be occupied with a detailed explanation of each disease.

Typhus Fever

Definition.—Typhus fever is also known as **spotted fever**, **jail fever**, **hospital fever**, **camp fever** and **ship fever**; it is an acute febrile disease, characterized by sudden onset, a maculated rash, and a clinical course terminating by crises, usually about the end of the second week.

Adjustment.—The adjustment in case of typhus fever is C. P. in combination with K. P. The adjustment of C. P. decreasing heat formation, and the adjustment of K. P. increasing heat dissipation.

Pathology.—There is no localized pathological condition in typhus fever. The fever is high and the eruption appears between the third and fifth days. The eruption consists of macular rose spots which soon become petechial.

Symptoms.—The onset of typhus fever is sudden with a severe chill or recurrent chills, followed by a rapid rise in the temperature. The temperature continues to increase for three or four days, by which time it has reached 104 to 107

degrees. The fever remains high for 10 days or two weeks, during which time there is headache, malaise, cough, a rapid pulse which is often dicrotic, severe pains in the spinal region radiating into the extremities and followed by extreme prostration. The tongue is heavily coated and dry, the coating being white at first, but later, as the temperature increases, it becomes dark brown and is fissured. The facial expression is dull and the face is flushed, eyes are congested and pupils contracted. The digestive symptoms are those common to febrile diseases, such as anorexia, nausea, vomiting and constipation. The spleen is enlarged, and the urine is scanty and highly colored. Delirium appears early in typhus fever, and this is a differential symptom from typhoid, in which it appears later. The delirium is often of the active type and may be followed by stupor or coma.

In the more severe cases there is carphologia, subsultus tendinum and coma-vigil. The rash appears first on the abdomen, from whence it spreads to all parts of the body. It consists of macular rose spots about 4 mm. in diameter, which soon become petechial and do not fade upon pressure, as in typhoid. This rash appears between the third and fifth days of the disease, while in typhoid it appears during the second week of the disease. Typhus can further be distinguished from typhoid by the course of the fever, abdominal distention and the Widal reaction of typhoid.

Relapsing Fever

Definition.—Relapsing fever is an acute febrile condition characterized by a definite febrile paroxysm lasting about six days, and followed by a remission lasting about the same length of time. This may be repeated several times, whence its name, relapsing fever.

Adjustment.—The specific adjustment in case of relapsing fever is C. P. in combination with K. P.

Symptoms.—The onset of relapsing fever is sudden, with a severe chill and rigor, followed by a rapid rise in the bodily

temperature, the fever reaching 104 to 106 degrees. There is intense headache and backache, with aching in the extremities. The pulse is rapid (110 to 130). The spleen is greatly swollen and may be palpable. When the fever runs high cerebral symptoms are manifest, delirium being the most constant. The fever remains high, usually for six days, but may have remissions of two or three degrees, with sweating. Occasionally a mild jaundice exists. On or about the seventh day the fever falls by crises, with profuse sweating, to reappear on the fourteenth day. During the week of apyrexia the symptoms disappear, the patient apparently is recovering and may be about well when on or about the fourteenth day there is another chill and rise in temperature, with a return of all previous symptoms. This relapse is usually of shorter duration, often lasting only four days, after which recovery may take place; however, there may be several relapses, with or without complications. Under Chiropractic adjustments recovery will take place at a rapid rate, as in other febrile conditions.

Dengue

Definition.—Dengue, also known as breakbone fever, is an acute febrile affection, characterized by paroxysms of fever, pain in the joints and muscles, an initial erythema, and a terminal polymorphous eruption.

Adjustment.—The adjustment in case of dengue is C. P. in combination with K. P. Some cases may require local adjustments, as would be determined by spinal analysis.

Pathology.—The joints of the extremities become greatly swollen early in the disease, and this swelling is associated with intense pain. The muscles become stiff (contracted to minimize pain), and the skin is hyperemic.

Symptoms.—The attack begins suddenly with headache, chilliness, and intense aching pains in the various joints of the body. The joints become swollen, red, tender, stiff, and painful upon motion. The pulse is rapid and the respiration

short, quick and shallow. The degree of prostration is great, with delirium and possibly other cerebral symptoms. Cutaneous hyperæsthesia is general. The rash may be of various kinds, as is indicated by the term polymorphous, and occurs at no definite time during the course of the disease. In some instances it resembles measles, in others scarlet fever, and in others may be petechial.

The distribution of the rash over the body is not distinctive, as in some cases it may first appear upon the hands and feet, in others upon the abdomen, and in others upon the thorax. Upon the fourth or the fifth day the temperature has reached 105 or 106 degrees and then falls by crises, with profuse sweating and amelioration of all symptoms, especially the pain. The apyretic period lasts two to four days, after which there may be recurrence for two or three days. The entire attack usually lasts less than two weeks.

Differential Symptoms.—Dengue is a disease of warm climates and may be mistaken for yellow fever, but in the latter there is a characteristic icteric tint to the skin, which occurs early in the affection, a slow pulse, with high fever and black vomit, which, with the absence of cutaneous eruption, is sufficient to form a differentiation. Dengue differs from acute rheumatism, in that it has no eruption; acid sweats and the course of the temperature in rheumatism is decidedly different.

Cerebro-Spinal Meningitis

Definition.—Cerebro-spinal meningitis is an acute febrile incoordination, in which there is an inflammation or excessive heat of the meninges of the brain and spinal cord. It is also known as cerebro-spinal fever, spotted fever and petechial fever.

Adjustment.—Atlas or axis, with C. P. and K. P.

Pathology.—The meninges become swollen and hyperæmic early, and especially is this true of the two inner membranes. This is followed by an exudation of serum into the

intermeningeal spaces, most marked at the base of the brain. The cranial and spinal nerve roots may be affected in this same manner as they leave the brain and spinal cord. There may be an engorgement in other organs of the body during the course of this disease, but such is only an associated condition not belonging to it.

Symptoms.—A severe chill with rigor marks the onset of the disease. This is followed by a rapid rise in the temperature of 101 to 104 degrees, intense occipital headache, spinal pain and tenderness, and possibly convulsions in children.

The muscles of the back and neck are hyperæsthetic and stiff, soon amounting to cervical retraction or opisthotonus. There are usually marked sensory disturbances, such as photophobia and hyperacusis. Strabismus, nystagmus, ptosis, and irregularity in the size of the pupil may exist. The cerebral symptoms of delirium, stupor and coma may appear early and are always present. Petechia is the most constant and common cutaneous symptom, and appears from the first to the fifth day, does not disappear upon pressure, and may be associated with herpes, erythema or urticaria. Some of the joints may be involved, amounting to a diffuse arthritis. The eyes are intolerant to light, and the senses of smell, taste, and hearing may also be affected. Kernig's sign is the principal diagnostic symptom of the condition. It is the inability to extend the leg when the thigh is flexed upon the abdomen. The test is usually made with the patient lying in the recumbent posture; the thigh is then flexed upon the abdomen and extension of the leg attempted by lifting or tension on the heel. If cerebro-spinal meningitis is present the leg cannot be extended, and the pelvis may be raised from the bed by the attempted extension. The temperature and pulse rate are irregular. The respiration may be of the Cheyne-Stokes character. The spleen is swollen and a leukocyte count will show a leukocytosis, affecting principally the polymorphonuclear cells. Cerebro-spinal meningitis, like many other diseases, may take on various forms, among which are the mal-

ignant or severe form. The malignant form usually has a fatal termination in a few days, is marked by symptoms of a great depression, and finally sudden collapse. The abortive type begins suddenly, terminates suddenly, and the patient usually recovers.

Influenza

Definition.—Influenza, which is also known as la grippe, grip and catarrhal fever, is an acute febrile condition characterized by slight fever, coryza and severe prostration, which is out of proportion to the height of the temperature.

Adjustment.—Since there are several forms of influenza, the adjustment will vary according to the form. In all forms C. P. and K. P. should be adjusted. In the respiratory form middle or lower cervical or upper dorsal should be included. In the gastro-intestinal form S. P. and upper lumbar should be included. In the nervous or cerebral form the atlas or axis should be included.

Pathology.—There is no localized pathology other than the inflammatory condition of the respiratory and alimentary mucous membranes, which is accompanied with its characteristic exudate.

Symptoms.—Often the onset is abrupt, with chilliness or chills, which may be recurrent, and a sudden rise in the temperature. The fever is variable in its course and is often of the remittent type. There is extreme drowsiness, malaise, headache, and general aching in the spine and extremities. The patient soon becomes very weak or prostrated, with anorexia, nausea, vomiting, restlessness, cough, watery eyes, sneezing and coryza. The hearing may become affected from the swelling and closure of the eustachian tube. The pulse is quick and compressible, with increased frequency in the respirations. The symptoms are usually so grouped that the attack is said to be the respiratory form, gastro-intestinal form, or the nervous form. In the respiratory form the respiratory symptoms usually predominate, and the foregoing

symptoms may be greatly exaggerated. The nervous form is characterized by delirium or stupor, with great debility and nervousness. The gastro-intestinal form has diarrhœa, abdominal pain, anorexia, nausea and vomiting, which may be persistent in character, a heavily-coated tongue, foul breath, and possibly biliousness.

Pertussis or Whooping Cough

Definition.—Pertussis is an inflammatory condition of the respiratory mucosa, distinguished by a convulsive cough and a long-drawn inspiration, during which time the characteristic "WHOOOP" is produced.

Adjustment.—Vertebral palpation will reveal subluxations in the lower cervical region or upper dorsal and K. P.

Pathology.—There is swelling and hyperæmia of the mucous membrane of the nose, pharynx, larynx and bronchial tubes, with diminished secretion, followed by an increased abnormal secretion of mucus, which rapidly becomes mucopurulent. The severity of the case depends upon the amount of swelling in the mucous membrane, the degree of obstruction offered to the passage of air into the lungs, and the purulence of the exudate.

Symptoms.—The symptoms of whooping cough are divided into three stages—catarrhal, paroxysmal and recuperative.

The catarrhal stage begins the same as an ordinary case of coryza, with sneezing, cough, watery discharge from the nose, which soon becomes muco-purulent, and if a child, usually more or less fretfulness exists. This stage usually lasts for eight or ten days, when it gives way to the—

Paroxysmal Stage.—Throughout the catarrhal stage the cough was of the bronchial type, dry and continuous, but now it assumes a distinctive paroxysmal character. This paroxysmal cough begins with a series of short coughs, followed by a long-drawn inspiration, during which time the whoop is produced. There may be several successive paroxysms of

cough, followed by the expectoration of a thick, creamy, viscid mucus, part of which may have been swallowed and will produce vomiting. The number of paroxysms may vary from one every five or six hours to two or three every hour, and continues for four or five weeks in the average case.

During the seizure of cough the face becomes deeply cyanotic, swollen and congested; the veins may stand out prominently upon the forehead and neck, and the eyeballs project. The eyes become congested, puffy, and the lids become pinkish; the conjunctiva may show petechia, and there may be attacks of epistaxis during the strain of coughing.

During the recuperative stage the cough lessens in frequency of occurrence and in severity. The amount of expectorate increases in quantity and the cough is loose. These symptoms gradually decrease until they disappear, the entire stage occupying about two weeks.

Parotitis

Definition.—Parotitis, which is also known as **mumps**, is an inflammation or excessive heat of the parotid gland, which is characterized by swelling, tenderness, and stiffness of the jaws.

Adjustment.—Subluxations are found in the middle cervical region, usually the fourth or fifth. If fever is present, also adjust K. P. or C. P.

Pathology.—There are swelling and inflammation of one or both parotid glands, often also involving the cellular tissue around and pervading the gland. The inflammation is catarrhal in character, begins in the ducts of the gland and rapidly extends to the gland proper. The infiltration of the serous fluid into the surrounding tissue often produces enormous swelling of the face and head, which subsides in eight or ten days. Occasionally the submaxillary gland, the ovaries or the testicles are involved.

Symptoms.—The onset of mumps is rather sudden, with general lassitude and slight fever, but in many cases the first

noticeable symptom is earache or a dull aching pain about the angle of the jaw, which is increased by the taking of acid into the mouth, as sour pickles. There may also be headache, loss of appetite and vomiting, but frequently the pain and swelling are the only noticeable symptoms. The swelling appears within 24 hours after the beginning of the pain around the ear, and at first is unilateral, usually on the left side. Within two or three days the swelling appears on the other side, and may be so extreme that it is difficult to recognize the patient. Mastication may be greatly interfered with, and it may become necessary for the patient to diet upon liquid food for a few days. Often swallowing, speaking and hearing will be impaired during the swelling of the gland. In the more severe cases the temperature may reach 104 degrees, and the duration of the affection lasts much longer than usual, which is about ten days. When orchitis develops there is swelling of the testicle, preceded by a sickening pain, which soon assumes a drawing character. This may last a variable length of time, but under adjustments the pain subsides within a few hours and the swelling gradually disappears. Ovaritis is a much more infrequent complication of mumps, and is associated with abdominal tenderness and pain upon deep respiration. The abdominal muscles become fixed, the respiratory movement is vertical, and the thighs may be flexed upon the abdomen. Two very unusual cases have been brought to the attention of the author, in which the entire vulva was enormously swollen, also the mammary glands. Both cases yielded to the Chiropractic adjustments.

Variola or Smallpox

Definition.—Smallpox is an acute febrile disease, characterized by an eruption, which passes through four stages, the papular, vesicular, pustular and crust.

Adjustment.—The specific adjustment in case of smallpox is C. P. and K. P. in combination with local sublaxations, as the symptoms of the case may indicate.

Pathology.—There is no localized pathological condition in smallpox. The general skin eruption is pathological. (See symptoms.)

Symptoms.—There are three forms of smallpox: 1. The discrete or moderate form. 2. The confluent or severe form. 3. The hemorrhagic, malignant or black smallpox, of which there are two varieties, purpuric and hemorrhagic pustular forms.

The discrete form begins suddenly, with recurrent chills and a rapid rise in the bodily temperature. There is intense headache, pains in the back over the kidneys which shoot down the legs. In children there are frequently convulsions in place of the recurring chills. The fever reaches 103 to 104 degrees within a short time, and delirium may be present during the first four days. The face is flushed, eyes bright, pulse and respirations increased, the pulse ranging from 100 to 130. The degree of prostration is very great early in the disease. The bowels are usually constipated, while the urine is scanty and highly colored. On the third or fourth day of the fever the eruption appears, first upon the forehead, lips and wrists as large, coarse macules, which rapidly become papular, so that the first stage is commonly known as the papular stage. These papules feel like shot under the skin upon palpation. With the appearance of the rash the other symptoms abate to a very marked degree. The fever then becomes remittent, and may entirely disappear early during the eruptive stage. Upon the fifth or sixth day the papules become vesicles, containing a clear serum and having slightly umbilicated centers. These vesicles become pustules on the eighth or ninth day, when the serum is transformed into pus and the pustule is non-umbilicated. The skin around the pustule is deeply red and swollen, while all of the intervening skin is reddish. The stage of desiccation begins on the tenth or twelfth day, when the pustules dry up, forming scabs. These scabs fall off about the end of the third week, leaving pits or scars.

During the pustular stage the fever again returns and is

known as the fever of suppuration. Throughout the crust stage the fever subsides by lysis, reaching the normal temperature by or before the eighteenth day.

Confluent smallpox is also known as the severe form. Its initial symptoms are about the same as those of the discrete form, except that the temperature may be higher. During the eruptive period the papules are more numerous and soon coalesce, although the confluency may not take place until the pustular stage. Frequently there are eruptions on the mucous membranes, with offensive discharges. Cerebral symptoms are common in this type, the most constant being delirium, stupor and coma.

Malignant or hemorrhagic smallpox is the most severe form, having a high mortality. There are two varieties—

Black or purpuric smallpox begins with high fever, lumbar pain, extreme prostration, and upon the second or third day a diffuse ecchymosis occurs beneath the skin and conjunctiva. The ecchymosis spreads until the greater part of the body is covered, giving it a dark or blackish color. There are hemorrhages from the mucous membranes, and death is usually the result, occurring within a week from the onset.

Hemorrhagic pustular smallpox proceeds like an ordinary severe case until the pustular stage, when hemorrhages occur into the pustules and from the mucous membranes. This form is also fatal. Both types of the latter form are rare and not common in America.

Smallpox can be distinguished from chicken-pox, in that the eruption of the latter usually appears upon the thorax instead of upon the face. The vesicles vary in size, are oval in shape, are superficial, and do not have a reddened areola. The constitutional symptoms are mild. No fever of suppuration.

Varicella or Chicken-Pox

Definition.—Chicken-pox is an acute febrile disease, characterized by mild fever and a vesicular eruption, which desiccates and desquamates in from three to five days.

Adjustment.—C. P. and K. P.

Pathology.—The skin eruption consists of small vesicles, which are entirely superficial and rarely coalesce. The vesicles are filled with a clear serum and dry up within three to five days after their appearance.

Symptoms.—The onset is usually sudden, with chilliness, slight fever, anorexia, vomiting, and aching in the back and legs, but in many cases these initial symptoms are absent, and the first noticeable symptom is the appearance of a vesicular eruption on the chest or elsewhere on the trunk. The vesicles are preceded by papules, but the papules become vesicles within a few hours, so that the papular stage is not always distinctive. The vesicles are discrete or scattered, ovoid in shape, with flattened tops, which are sometimes umbilicated. They contain a clear fluid which becomes cloudy in two days. The crusts are dark brown in color and form during the third to fifth days. Desquamation occurs within a week without leaving pits or scars. As a rule varicella is readily recognized.

Vaccinia or Vaccination

Definition.—Vaccinia is a form of eruptive incoordination resulting from the introduction of vaccine virus into the human system by inoculation.

Adjustment.—A. P. or local with K. P.

Poisons are continually being formed as by-products of metabolism in the body. This poison is being eliminated from the body by the excretory apparatus as rapidly as possible, hence no serious effects are noticed because of their formation. There is no time at which the body does not contain some of this metabolistic poison, and has so adapted itself to this amount. But should more poison be introduced into the human system than can be properly eliminated by the kidneys, it will have a poisonous effect upon the body, and will give rise to symptoms of disease. This is the case in vaccination. In many very healthy people the vaccination will not "take" the first time, but by increasing the dose the second

time it will have the desired (?) effect. This is because a greater quantity of poison has been introduced into the system than can be eliminated or than the body can adapt itself to, hence the appearance of symptoms, and symptoms do not occur in health, only disease.

Symptoms.—Two or three days after inoculation a papule appears at the point of inoculation, and gradually increases in size until the sixth day it is an umbilicated vesicle containing a clear serum. By the tenth day this serum suppurates or becomes purulent, and the vesicle is transformed into a pustule. In two or three weeks desiccation begins. During the pustular stage there is usually some fever, swelling of the arm, axillary glands, and frequently a swelling of the entire extremity with its lymphatic glands. By the third week the crust has completely formed, and falls off within the following two weeks, leaving a deep scar or pit.

It is not uncommon to have serious complications with vaccination, such as multiple abscesses, erysipelas, tetanus, eczema, syphilis, leprosy, ulcerations, gangrene, and the disease of smallpox itself frequently occurs after a vaccination. What could be more dreaded than such a list of complications? And who can tell which of them may occur? Often the arm is amputated in order to save the life, but the poison has been scattered throughout the body, and it is but a short time before it breaks out elsewhere. The only safe precaution is to prevent the inoculation. The vaccination is more fatal than the disease it is supposed to prevent.

Scarlatina

Definition.—Scarlatina is also known as scarlet fever. It is not a mild form of scarlet fever, but is the disease itself. It is an acute febrile disease characterized by fever and a diffuse scarlet exanthem, which disappears with desquamation.

Adjustment.—C. P. and S. P., both of which may be the same vertebra, in combination with K. P. and possibly lower

cervical, as will be determined by vertebral palpation and the symptoms that may indicate such.

Pathology.—The skin is the seat of an acute inflammation, which fades away upon pressure and after death. The throat is also greatly inflamed, and may be the site of ulcerations. Granular degenerations may occur in the liver, spleen, kidneys and muscles.

Symptoms.—The disease is initiated by a chill and a rapid rise in the bodily temperature, the fever reaching 103 to 105 degrees. The throat is swollen and sore, causing dysphagia. A vomiting noted for its persistency is an important initial symptom. The pulse rate is rapid (110 to 140), and in 24 hours the rash appears, first upon the chest and neck, but spreads over the entire body within a few hours. From a distance the skin appears to be uniformly red, but upon close inspection the eruption is found to consist of minute closely set red spots. Occasionally the rash rises in patches, and may become papular in form. There may be petechia and ecchymosis, and occasionally sudamina. The rash remains bright red for about a week, when it gradually fades away, after which desquamation begins and lasts from two to six weeks. With the appearance of the rash the throat symptoms become prominent. Swallowing is difficult, there is pain and tenderness in the throat and jaws, and inspection reveals a catarrhal inflammation of the pharynx and tonsils. At first the tongue is covered with a heavy white fur, through which extends the swollen red papillæ, giving to it the characteristic strawberry appearance. Within a few days the fur exfoliates, leaving the tongue bright red, after which it is known as the raspberry tongue. The spleen is somewhat enlarged, and headache, restlessness and insomnia are usually present. Nocturnal delirium is present in the more severe cases. The urine is scanty, highly colored and often albuminous. The fever declines on the fourth to sixth day by lysis, and convalescence is slow but gradual.

Anginoid scarlet fever is marked by a predominance of the throat symptoms, with high fever and great prostration. Early this form resembles diphtheria and tonsillitis. It is distinguished from diphtheria by the appearance of the rash and the strawberry tongue, and from tonsillitis by the condition of the tongue plus the course of the temperature.

Malignant scarlet fever is characterized by convulsions, delirium, muscular twitching, a very high fever of 107 to 108 degrees, a weak, irregular heart and symptoms of collapse, which may occur before the appearance of the rash.

Measles or Rubeola

Definition.—Measles is an acute febrile condition characterized by an initial coryza and a rapidly spreading macular eruption.

Adjustment.—C. P. and K. P. in combination with middle or lower cervical region for the respiratory catarrh.

Pathology.—The only pathological condition met with in measles is a catarrhal inflammation of the mucous membrane lining the respiratory passages.

Symptoms.—Measles begin with chilliness, sneezing, drowsiness, cough, which at first is dry but later becomes loose, and is accompanied by expectoration. The eyes are watery, the conjunctiva is reddened, and photophobia is also a prominent symptom. There is headache, nausea and vomiting during the early stages, after which the fever rises gradually during the first two days, then remits for a few days, usually two, but appears again with the appearance of the rash. The rash is macular in form. The macules are from two to four mm. in diameter and are first noticed on the face, from which they spread to all parts of the body. This gives to the skin a mottled or blotchy appearance. When the eruption has reached its height it is most marked upon the trunk and disappears upon pressure.

About the sixth to eighth day the fever falls by crisis

and the symptoms lessen in severity. The rash fades and finally desquamation occurs in fine scales and is spoken of as branny scaling. The eyes remain very sensitive to light. The sense of taste is lost and the ears may still be sensitive to sound, but this gradually diminishes as strength is regained.

In black measles the rash becomes hemorrhagic, or may consist of petechial spots which increase in size, finally forming ecchymosis. The mortality in black measles is high.

German Measles or Rubella

Definition.—Rubella is an acute febrile disease of moderate severity, characterized by a mottled macular rash and a mild initial coryza.

Adjustment.—C. P. and K. P., with local for the respiratory catarrh.

Pathology.—The mucous membrane of the nose, throat and bronchi is inflamed, red, swollen, and has a catarrhal exudate. The skin is covered with a macular rash. Macules are small and of a rose red color.

Symptoms.—Rubella is initiated by a sore throat, chilliness and a slight fever, headache and backache radiating down the legs. There are slight coryzal symptoms, but not so severe as in rubeola. The rash appears upon the first or second day, and may be the first symptom to manifest itself. It is first noticed upon the face, from whence it spreads to all parts of the body within 24 hours.

Character of the Rash.—The rash consists of slightly elevated, rounded or oval, and usually discrete, spots which are of a rose-red color. A macular eruption also appears upon the mucous membrane of the throat and lasts for the same length of time as the skin eruption, which is from three to five days. The desquamation is branny. The site of each macule is marked by a small brown spot of pigment, which gradually fades. Often the cervical glands are swollen, but, as a rule, the constitutional symptoms are light, and the char-

acteristic eruption with very slight fever may be all the symptoms noticed.

Differential Symptoms.—Measles is distinguished from German measles by the severe initial coryza, Koplik's spots, higher fever, marked constitutional symptoms and longer duration of the former. The macules of measles are also darker in color and larger in size.

Diphtheria

Definition.—Diphtheria is an acute febrile incoordination characterized by a fibrinous exudate from the mucous membrane of the throat, which forms a false membrane.

Adjustment.—S. P. and K. P. with lower cervical, including 4th cervical in the nasal type.

Pathology.—There are three forms of diphtheria, named according to the location of the false membrane. They are pharyngeal, laryngeal and nasal. The pathological condition is the same in each except in location.

At first there is a swelling and redness of the mucous membrane, congestion of its blood vessels, and increased secretion of a thick viscid mucus. The redness covers the entire mucous membrane and is accompanied by an exudation, which at first may be localized in one or more patches, all of which soon coalesce, forming an extensive membrane which covers the entire mucous surface.

The exudate contains much fibrin, which forms a network, in the meshes of which are contained pus cells, epithelial granular cells, mucus and albumin. It is of a gray or white lead color and cannot be stripped off without leaving a bleeding surface. It is commonly spoken of as coagulation necrosis.

About the ninth day a process of suppuration occurs beneath this false membrane, separating it from the mucous membrane and causing it to slough off.

Symptoms.—The onset is sudden, with chilliness, headache, pain in the back, aching in the extremities, and a sudden rise in the bodily temperature to 103 or 104 degrees. The

throat is inflamed and sore, with marked dysphagia. The adult symptoms depend upon the location of this false membrane.

In **pharyngeal diphtheria** the tonsils and fauces are swollen and red, resembling tonsillitis, the glands of the neck may be enlarged and tender, and the neck may be stiff. Shortly the exudate will appear upon the mucous membrane of the tonsils, gradually spreading until it reaches the pillars of the fauces, the uvula and the posterior pharyngeal wall. The membrane is closely adherent to the mucous membrane and cannot be stripped off without leaving a bleeding surface. The membrane may present such a degree of obstruction that the patient may suffocate, but this does not occur so frequently as it does in the laryngeal form.

About the eighth or tenth day suppuration occurs beneath the false membrane so that it sloughs off and is expectorated, after which recovery is rapid. In a few cases the exudate is confined to the tonsils and is called lacunar or tonsillar diphtheria. It resembles tonsillitis and is usually differentiated by a microscopical examination.

Laryngeal diphtheria is also known as membranous croup. In this form the false membrane forms upon the mucous membrane of the larynx, and may be an extension of the pharyngeal type. The leading symptoms are a croupy cough, hoarseness or aphonia, dyspnea, and signs of progressive laryngeal stenosis. The face may become deeply cyanosed, the respiratory muscles retracted, and the patient in a state of intense restlessness.

The sterno-mastoid muscles are prominent, assisting in the labored breathing, and the nares may be dilated. Shreds of the membrane may be coughed up, after which there may be relief for a short time. If the membrane extends downward into the bronchi complete stenosis may occur, from which the patient suffocates.

Nasal diphtheria is usually an extension of the pharyngeal form and is associated with it. There is mouth breath-

ing, offensive and bloody discharges from the nose, epistaxis, high fever and extreme prostration.

Diphtheritic paralysis is the most common sequel of diphtheria, and may follow any of the three forms. It occurs in 10 to 15 per cent of the cases, usually during the stage of recovery. This is a toxic neuritis, and will disappear as soon as the toxins are eliminated from the body. It usually affects the uvula and soft palate, and is characterized by nasal voice, regurgitation of food through the nose, dysphagia, and disorders of taste and hearing.

Erysipelas

Definition.—Erysipelas is an acute febrile, localized, septic poisoning, characterized by a specific inflammation and swelling of the affected part.

Adjustment.—The adjustment for facial erysipelas is 4th cervical in combination with C. P. and K. P.

Pathology.—Local cutaneous redness, with swelling and edema, produced by an infiltration of serum in the subcutaneous tissues of the face, are the principal structural changes noticeable in the disease.

Symptoms.—Facial erysipelas is by far the most common form, and is initiated by a severe chill or chilliness, followed by a rapid rise in the bodily temperature to 103 or 105 degrees. This is accompanied by prostration, dry, coated tongue, feeble heart action and delirium. Gastric symptoms, such as anorexia, nausea and vomiting, are often common. A small red spot is then noticeable upon the bridge of the nose, and expands to the cheeks, forehead and ears. The reddened area becomes swollen, the skin is red, glossy and tense. The swelling around the eyes may be so great as to obstruct vision. Small vesicles appear upon the swollen area and may be accompanied by a burning pain. The cervical glands become swollen, and the throat is red and sore. The fever remains high with slight remissions for seven or eight days, when

it terminates by crisis with profuse sweating. Upon the disappearance of the fever the swelling subsides and desquamation follows. Occasionally the accumulated serum beneath the skin undergoes suppuration, and an abscess is formed at the angle of the jaw. If this complication arises there is an irregular fever, inability to open the mouth, weakness and emaciation. The affection rapidly yields to adjustments, even though in the last mentioned stage.

Toxaemia

Definition.—Toxæmia is a form of blood or serous poisoning, resulting from the absorption of poison from some local lesion or pathological condition. Ex.—Diphtheria, typhoid, erysipelas or tetanus. Sapræmia is a form of toxaemia, due to the absorption of putrefied toxins.

Adjustment.—C. P., K. P. and local, depending upon the location of the pathological condition from which the toxins are being absorbed.

Symptoms.—Toxæmia begins with general malaise, weakness, restlessness, headache and slight fever. Of these the fever is the most pronounced and constant symptom. The pulse is rapid and weak. There is usually a leucocytosis and the symptoms of the pathological condition from which the toxins are being absorbed. It is of marked importance to note that toxæmia begins with slight chilliness and not a severe chill and rigor.

Pyemia

Definition.—Pyemia is an incoordination in which there is the absorption of pus from suppurative or other pathological conditions, such as ulcerations or abscesses.

Adjustment.—C. P., K. P. and local.

Pathology.—Pyemia is usually associated with multiple abscesses. The blood vessels in the surrounding area of the abscess will become inflamed, their lining endothelium will be-

come thickened, and they may become obstructed by thrombi. The most common locations of the abscesses are liver, spleen, kidneys and lungs.

Symptoms.—The onset of pyemia is marked by a severe rigor and chill, which is followed by a rapid and high rise in the bodily temperature, the fever reaching 103 to 105 degrees.

The fever is very irregular in its course, being suppurative in its type and having intermissions, during which time there are sweating and recurrent chills. The chills, high fever and sweating recur at irregular intervals. There is usually anorexia, nausea and vomiting. The urine is scanty and highly colored, the bowels are costive, the tongue is coated, the skin is hot and dry, the pulse is feeble and rapid, there is great prostration, weakness, and the skin may be moderately discolored from toxic jaundice.

If the hyperpyrexia is prolonged the patient will become delirious, stuporous or comatose, from which it is impossible to arouse him.

In most cases the local symptoms of the associated condition can be recognized long before there are any symptoms of pyemia, and in cases where the primary condition is abscess it is usually found that the abscesses are multiple, being located in various organs of the body.

The cardinal symptoms of pyemia are irregular chills, fever and sweats, together with the discovery of a primary focus of suppuration or pus formation. In pyemia, delirium and coma occur as a late symptom, while in septicemia they appear early.

Septicemia

Definition.—A form of blood or serous poisoning occurring, with or without any known avenue for entrance of poison into the body. This may follow wounds, surgical operations, etc.

Adjustment.—C. P., K. P. and local, if wound occurs.

Symptoms.—These may occur following the wound by a rusty nail, vaccination very frequently, surgical operations made with filthy instruments, and after childbirth.

The onset is sudden with a sensation of chilliness and a moderate rise in the bodily temperature. The fever is usually of the continued type, but may have decided morning remissions. There are headache, anorexia, nausea, vomiting, and an early delirium. The pulse is small and rapid, the tongue becomes dry and brown, the spleen becomes enlarged, and there is a general enlargement of the lymphatics in the locality of the part affected. There may be red streaks radiating outward from the local condition and a general congestion of the part. Pain is intense.

The early prostration, delirium and coma are characteristic symptoms of septicemia. There may also be a slight toxic jaundice, petechial spots on the skin and albumen in the urine.

Yellow Fever

Definition.—Is an acute febrile incoordination characterized by toxæmia of varying intensity, jaundice, and a marked tendency to gastric hemorrhage.

Adjustment.—C. P., S. P. and K. P.

Pathology.—The general fever produces abnormal metabolism, increasing the bulk of the metabolic break-down material in the body, thus increasing the work of the spleen and causing its enlargement. There is an inflammation of the mucous membrane of the bile ducts, with swelling of the membrane, which diminishes the size of the lumen and produces jaundice. There is malnutrition of the blood, which results in disintegration of the red blood cells. Various forms of granular degeneration may occur in the viscera. Hemorrhages occur from the vessels of the mucous membranes, especially those of the stomach.

Symptoms.—The symptoms may be divided into three stages, the initial, remission, and collapse.

The initial or first stage begins with chilliness, or more suddenly with a chill, and is followed by a rapid rise in the bodily temperature to 100 or 106 degrees. This is accompanied with severe headache, pain and aching in the back and limbs, a sore throat, a coated tongue which becomes brown and fissured, epigastric tenderness, nausea and vomiting.

The face is flushed, the eyes are red and congested and are extremely sensitive to light, the eyelids and lips are swollen and thickened, and a very slight subicteric tint is noticeable in the conjunctiva and skin.

The stage of remission is marked by a decided remission or possibly an intermission in the temperature and a decrease in all of the symptoms. The fever may fall by crisis during this stage and recovery occur, but usually the fever again rises in two or three days and the remission gives way to the stage of collapse.

With the second rise in the bodily temperature the skin becomes deeply bronzed or jaundiced, there is severe vomiting, the vomitus often being of a black color and consisting of altered blood, which has partly undergone digestion, lost its oxygen and become black in color. There may be epistaxis or bleeding from the gums, the appearance of petechial spots on the skin, and scanty urination, the urine containing blood. In rare cases the urine may be completely suppressed, and the result is uremia. During this stage the pulse is slow.

The signs of collapse become prominent and herald death. The pulse is small, rapid and easily compressible, the respirations are accelerated and shallow, the face is pale, the temperature is low, possibly subnormal; there is an anxious expression on the face, and finally death. Otherwise the fever terminates by lysis in two or three days.

Dysentery

Definition.—An acute inflammatory incoordination of the mucous membrane lining the intestines, characterized by the

frequent discharge of blood-stained mucus, tenesmus and griping.

Adjustment.—C. P., K. P. and local in the lumbar region, according to the part of the intestine affected. This is usually the lower part of the small intestine or the colon, therefore would be the second lumbar vertebra.

Pathology.—The colon is most frequently affected, and at the beginning its mucous membrane becomes swollen and its vessels congested. This is due to the extensive heat, which produces a relaxation of the muscular fibres of the vessel walls, increasing the lumen of the vessel, decreasing the velocity of the blood and permitting a slow osmosis of serum into the surrounding submucous tissues. The follicles of the colon become swollen and may become the site of ulcers. There is a profuse exudation of abnormal or transformed mucus from the mucous membrane, which, when hemorrhages occur, is blood stained.

Nerve Tracing.—Tenderness is noticeable from the lumbar foramen to the region over the colon, becoming diffuse over the abdomen.

Symptoms.—There are five forms of dysentery, or bloody-flux, as it is sometimes called. They are: Catarrhal, acute specific, amœbic, diphtheric, and chronic.

Catarrhal Form.—This begins with a moderate diarrhœa, which lasts as long as there is fecal matter in the intestines. After two or three days griping abdominal pains appear, and the stools are increased in frequency, consisting of a catarrhal mucus. There is much straining and great tenesmus. At first the stools are partly fecal, but later become mucus or muco-purulent and are blood stained. There is a constant feeling of rectal fullness, pressure and a sensation of bearing down in the pelvis. There is usually a slight fever of 102 degrees, thirst is excessive and is a cardinal symptom, the pulse becomes rapid and weak, and the individual may become greatly prostrated from the frequent and painful evacuations. The number of stools may vary from 10 or 12 to 200 per day.

The patient loses a great deal of flesh, and though the condition may last only one or two weeks it may require several weeks or months before strength is regained.

Acute Specific Form.—This is a tropical form and does not occur with any degree of frequency outside of Japan and the Philippine Islands. The onset is sudden, with colicky abdominal pains. The stools are of a serous consistency at first, but soon become mucoid and blood stained. Tenesmus is constant; the fever is moderate and accompanied with anorexia, nausea, weakness, thirst, scanty or dark colored urine, coated tongue and foul odor of the breath. This form may be fatal within 48 hours, or recovery may begin within two or three days, but the usual course of the affection is 15 to 20 days. Recuperation is slow.

Amæbic Form.—This form has a very gradual onset with and increasing diarrhœa, fever is slight and may be absent, there is griping and tenesmus at the onset only, and at the beginning the stools are frequent and very fluid, later becoming yellowish-gray in color and containing blood and mucus. There is gradual and steady loss of flesh and strength, and anemia may develop. The course of this form is as if it were subacute and lasts from six to twelve weeks. The patient recovers slowly because of the extreme emaciation and anemia which has occurred.

Diphtheric Form.—This form of dysentery is characterized by the formation of a pseudo-membrane upon the mucous membrane of the intestine, and most frequently forms in the colon. The onset is similar to the catarrhal form, with a moderate diarrhœa, anorexia, nausea and vomiting, tenesmus, griping, and a slight fever. As soon as the false membrane forms in the colon there is severe abdominal pain localized at the point where the false membrane is formed. Then the evacuations become less frequent, and the stool will contain portions of the false membrane that has sloughed from the intestinal wall. If the membrane does not slough off intestinal obstruction may result, with fecal vomiting and collapse.

The false membrane is detached from the mucous membrane by a process of suppuration occurring between them. During this period there is high fever and, possibly, delirium and stupor.

Chronic Dysentery.—This is a prolongation or continuation of the acute variety, and in the United States is usually of the catarrhal type. There is no fever in the chronic form, the stools may vary in number from 4 to 20 in 24 hours. They are usually yellowish-brown in color and may be frothy. At times they may be blood stained, and not uncommonly ulcers form upon the mucous membrane of the colon. Tenderness is traceable over the region of the colon to the lumbar region of the spine. The individual becomes weak and emaciated, and more or less constantly tired. In chronic diarrhœa the stools do not contain blood and there is no tenesmus and griping, all three of which are conditions present in dysentery or bloody-flux.

Cholera-Asiatica

Definition.—An acute febrile incoordination, characterized by severe purging and a rapid collapse.

Adjustment.—C. P., K. P. and second lumbar.

Pathology.—The mucous membrane of the intestines becomes inflamed and swollen; Peyer's patches are enlarged and swollen; the blood vessels are congested, and there is exudation from the mucous membrane, consisting of mucus, serum, fibrin, and destroyed epithelium from the functioning glands of the intestine, and from its villi and lining membrane. The basement membrane of the intestinal glands is left exposed. The stomach and intestines contain large quantities of a thin milk-like fluid, which is effused from their lining membrane.

Symptoms.—The symptoms are usually grouped into three stages—

First Stage.—Begins with colicky abdominal pain and a moderate or severe diarrhœa, with headache, mental depression, nausea, vomiting, and great weakness or debility. If

the patient should recover during this stage the condition is called **cholérine**.

Second Stage.—Is also called the stage of collapse, and is marked by persistent vomiting of a thin, watery or serous fluid resembling the stools, which in this stage also become serous in character and are evacuated usually without pain, but there may be tenesmus at times. The tongue is dry and coated and thirst is excessive. The patient rapidly becomes exhausted and weak, the skin becoming cold, clammy and shrunken, the lips and fingers cyanosed, the face pallid, the eyeballs recede, the surface temperature is far below normal (95), while the internal temperature taken per rectum may be 104 degrees. Mental disturbances are common, the patient lying in a stupor or coma during the entire stage. This stage, as a rule, lasts two or three days, after which the third stage supervenes. Death may occur during the second stage.

The stage of reaction is marked by an increase in the surface temperature, increase in the flow of urine, return of color to the face, the increasing strength of the pulse, and the deeper respirations. The stools become less frequent, take on a fecal character, and the patient gradually recovers.

The second stage is considered the grave stage, and usually lasts two or three days, death or recovery taking place at the expiration of this time, depending upon the general condition of the patient, and this in turn depends upon the degree of pressure upon the nerves, shutting off a great or a small quantity of mental impulses.

Chiropractic adjustments will release this compression upon the nerves, thereby restoring the proper flow of vital energy to the affected parts, and coordination results.

Bubonic Plague

Definition.—An acute febrile incoordination of very rapid course, characterized by inflammation and enlargement of various glands, carbuncles and hemorrhages.

Adjustment.—C. P., K. P. and lower lumbar region.

Pathology.—The inguinal and other lymphatic glands become swollen, congested and soon suppurate, discharging pus externally, or the pus may be absorbed internally. Hemorrhages occur beneath the skin and into the cavities lined with mucous membrane. Carbuncles appear upon the gluteal muscles, back and legs.

Symptoms.—The initial symptoms are headache, backache with stiffness in the muscles, vertigo, mental depression, rapid respiration, epistaxis and hemoptysis. After 24 hours' duration the adult or secondary symptoms are apparent. They begin with a chill and a rapid rise in the temperature to 104 or 106 degrees. There is intense thirst, the tongue is dry and brown, and there are nausea, vomiting and delirium. Minute subcutaneous hemorrhages, known as petechiæ, occur and may become so large that they are called ecchymoses. Varying from the second to the fifth day the inguinal glands become swollen, forming the buboes, from which the disease gets its name. The axillary, cervical and popliteal glands may also become swollen. The glands undergo suppuration, the pus being discharged externally, or may be absorbed and eliminated through the kidneys. Carbuncles form upon the lower spinal muscles, hips and upon the legs.

The internal form is marked by similar eruptions occurring upon the mucous membranes, and hemorrhages from the mucous membranes, from which death suddenly results. The mortality varies from 75 to 90 per cent.

Malarial Fever

Definition.—Malaria is an acute febrile condition characterized by an intermittent or a remittent fever.

Adjustment.—C. P., K. P. The adjustment at C. P. decreases heat generation and the adjustment at K. P. increases heat dissipation and increases elimination of toxins.

There are two forms of malaria common, the intermittent and the remittent forms.

Intermittent Form.—Its symptoms may be divided into three groups, viz.: Those of the chill period, fever period, and sweat period.

The chill period begins with malaise, languor, headache, gastric uneasiness, nausea and vomiting. The chill begins abruptly, with violent shaking, chattering of the teeth, coldness of the skin, cyanosis of the face and hands, and a rapid pulse. Internally there is a high fever, which is soon manifest externally and gives rise to the fever period. The fever reaches 105 to 106 degrees, the skin is excessively hot and reddened, the tongue is coated, the breath is foul, the bowels are constipated, the spleen is enlarged, and formerly was called the "ague cake" because of its great size; the skin may have a dark tinge, and there may be delirium, stupor or coma.

The fever falls by crisis after a duration of two to six hours, with profuse sweating, after which the patient feels relieved. Paroxysms of these three periods occur with a great deal of regularity every day or every second or third day.

The Remittent Type.—This is so called from the type of its fever, which is remittent rather than intermittent. The fever is subject to marked remissions, which occur with a varying degree of regularity. The fever begins suddenly, with a single initial chill. There is a great deal of prostration, petechia and ecchymosis, with cerebral symptoms also present. Delirium is the most persistent cerebral symptom. Malarial cachexia develops in almost all cases, giving to the skin a dark brownish color, and this is a cardinal symptom of the disease.

This cachexia is due to the inability of the excretory organs to properly eliminate the waste materials from the body, and as a result the blood becomes deprived of proper nutrition, is subjected to the presence of toxins, and, therefore, undergoes disintegration. This throws an increasing amount of work upon the spleen and causes its adaptative hypertrophy. After recovery the spleen may remain en-

larged and tender. The mortality of this form is much greater than in the intermittent form.

Acute Rheumatic Fever

Definition.—An acute febrile condition in which there is multiple arthritis attended by great pain.

Adjustment.—C. P., K. P. and local for the extremities affected.

Pathology.—The joints, usually the wrist, ankles, elbows and knees, are the site of the inflammation. They become red, swollen from edema, and tender. The synovial membrane is especially affected, so that the movement of the joint produces great pain, and to minimize this pain the muscles remain contracted.

The synovial membrane may become permanently thickened, the bones may become deformed and the joint may become stiff from the exostosis and ankylosis that frequently results from the inflammatory process.

Also called inflammatory rheumatism and articular rheumatism.

Symptoms.—The fever is preceded by a sensation of chilliness, or by a severe chill, with rigors, malaise, aching pain in the joints, sore throat, anorexia, nausea, and perhaps vomiting. The fever rises suddenly to 102 or 104 degrees, with its attending symptoms of debility, costiveness, spinal aching, hot dry skin, scanty and highly colored urine, and digestive disturbances.

This usually affects the wrist, ankle, elbow and knee joints, but may affect all the joints of the body. They become hot, red, swollen, tender and painful upon motion. The inflammation seems to be in the tissues around the joint rather than in the joint. The synovial fluid is suppressed in secretion, and the muscles adjacent to the joint are contracted so as to prevent motion, thus minimizing pain. The fever runs an irregular course, and at times there is sweating. The sweat is highly acid, as can usually be determined by the

odor, or by gliding the fingers over the skin. The urine is scanty and highly colored, containing much acid; the acidity being over forty degrees. The bowels are constipated, the tongue is furred, and sudamina appears upon the skin around the joints affected.

The course may be acute, recovery taking place after a few weeks duration, or it may be subacute or chronic. In the chronic cases the fingers, wrists, ankles and other joints affected become permanently deformed and stiff.

Lobar Pneumonia

Definition.—An acute febrile condition characterized by a catarrhal inflammation of the mucous membrane, lining the bronchial tubes and their communicating air cells, with consolidation of the cells affected. This disease is also called adult pneumonia, lung fever, unilateral pneumonia, Frank pneumonia, and acute pneumonia.

Etiology.—Subluxation at Lu. P. The adjustment should include C. P. and K. P.

Pathology.—The pathology of pneumonia may be divided into three stages, viz.: First, or stage of engorgement; second, or stage of red hepatization; third, or stage of gray hepatization.

The first stage begins with the onset of the disease or as soon as there is excessive heat in the mucous membrane of the bronchi, which produces a relaxation of the muscular fibres forming the walls of the capillaries, resulting in their dilatation and hyperemia. The velocity of the blood stream is diminished, and there is a slow vascular exudation upon the mucous surface. The lung substance becomes swollen and non-elastic. Expansion is diminished and a section of the engorged lung is heavier than the normal.

The second, or stage of red hepatization, is so named because the exudate not only contains mucus, serum, fibrin, albumen and destroyed epithelial cells, but also contains red blood cells in large quantities, which gives to the exudate a

reddish color. This red exudate fills up the terminal bronchioles and communicating air cells, producing the condition known as consolidation. The consolidated part is confined to one or more lobes of one lung; there is non-expansion of this part, and when a section is placed in water it sinks, indicating an increase in the weight of the lung structure.

The stage of gray hepatization occurs upon suppuration of the exudate, whereupon the red cells undergo disintegration, the hæmoglobin is reabsorbed and the remains of the erythrocytes are transformed into pus cells. This process takes from the exudate the red color, leaving a grayish or pus color to the cross section. A large portion of the exudate is coughed up and expectorated during this stage, and the remainder is absorbed and eliminated through the kidneys. In the stage of gray hepatization the lung structure is heavier than in any other stage, always sinking when placed in water, and is opaque to the rays of the X-ray.

Nerve Tracing.—Tenderness is traceable from the 10th intervertebral foramen on the side affected, outward under the scapula and axilla, becoming diffuse over the region of the lung affected.

Symptoms.—The onset is usually sudden with a prolonged chill and rigor, which is followed by a rapid rise in the bodily temperature. There is general aching, headache, and a short, dry cough, which is suppressed on account of the thoracic pain which it produces. There are usually stitch pains around the nipple, under the axillar or beneath the scapula, which is directly over the area of the lung affected by the inflammation. The respirations are rapid and shallow, the pulse is full and strong and fast, the nostrils are dilated in breathing, and the face is flushed on the cheek of the affected side.

The cough increases and soon is accompanied by expectoration of the characteristic variety, made so by the mixing of blood with the mucus exudate. This expectorate is very viscid and adhesive, and is sometimes spoken of as a rusty sputa. Herpes labialis occurs in most all cases, and is a

symptom of some diagnostic importance. The tongue is furred; there is anorexia, nausea and some vomiting. The urine is scanty and highly colored, and there is a retraction of the upper abdominal muscles. There may be tympanities and swelling of the abdominal glands.

The pain is more severe when the pleural aspect of the lung is affected, and may be noticeable in the region of the nipple, axilla or scapula. After the third day the expectoration becomes very copious, is of a rusty or prune-juice color, and gives some relief when expectorated.

Upon inspection it will be seen that expansion is deficient in the affected side upon inspiration, or if it should occur that the affection is bilateral, this deficiency will be seen on both sides.

The patient usually lies upon the side affected, so as to facilitate expansion of the unaffected side. The accessory muscles are brought into play to assist in breathing, as will be seen upon inspection of the chest and neck. The sternomastoids stand out prominently during inspiration.

The fever usually falls by crisis after having been of the continued type for a week. With the fall in the temperature the expectoration is increased, strength is regained, exudation ceases, and absorption of exudate occurs from the mucous membrane of the lungs. From this on recovery is progressive, except in those cases in which the consolidated area remains so. In this event suppuration may take place, the consolidated area undergo necrosis, and an abscess will form. The symptoms then will be that of abscess of the lung. (See section on diseases of the lung.)

There are different forms of pneumonia, which are all dependent upon the different nerves impinged and the degree of pressure upon them.

Typhoid pneumonia is a form which is very severe in character, and in which the typhoid state supervenes. In this the cerebral symptoms predominate, consisting of delirium, prostration, stupor, coma, subsultus-tendinum, and carphologia.

Latent pneumonia is a form which is mild in character, and the symptoms of which do not appear until the stage of consolidation is reached.

Abortive pneumonia is a form in which the duration is less than the usual week and recovery is rapid.

Central pneumonia is so named because the consolidation begins in the center of a lobe. In this form pleurisy pain at the onset is not present.

Wandering or creeping pneumonia is a form in which consolidation spreads from lobe to lobe, affecting the entire lung.

Obstructive pneumonia is a form in which the circulation of the blood through the capillaries of the affected area of the lung is hindered. This is produced by the pressure of the exudate in the air cells against the wall of the blood vessels, and is favored by the position of the patient. The part of the lung thus consolidated and in the lowest level is the part which becomes congested, and the congestion is known as hypostatic congestion.

Hepatization is the changing of a substance so that it resembles the liver in appearance. In pneumonia this is brought about by the oozing of blood from the pulmonary capillaries into the consolidated material, giving to it a reddish purple color. After the red cells lose their oxygen they become darker, and more closely resemble the liver in appearance.

The adjustment produces sweating, with a lowering of the temperature; stops the exudation, and the patient regains strength. The exudate is expectorated, breathing becomes normal, and the patient recovers in less than half the usual time.

Tuberculosis

Definition.—Tuberculosis is an acute or chronic affection characterized by the formation of tubercles, which have a tendency to unite and undergo caseous, fibroid and other degenerative changes. The lungs are most frequently affected, but

tuberculosis may exist in any part of the body, in any organ, or may exist generally throughout all of the tissues.

The disease is given different names, according to the different forms and location of the tubercles. There are three forms of acute miliary tuberculosis, viz.: The general or typhoid form, the acute tubercular meningitis, and the acute miliary tuberculosis of the lungs.

The General or Typhoid Form of Tuberculosis

Definition.—An acute form of tuberculosis in which the tubercles are scattered throughout the body in all tissues, and in which the symptoms of the typhoid status predominate.

Adjustment.—C. P., K. P. and possibly atlas.

Pathology.—The tubercle is the principal pathological structure in all forms of tuberculosis, and in this form they are found scattered and infiltrated throughout all the tissues of the body, including the bones and muscles. During the early stages the tubercles are small and microscopic in size, but soon coalesce, forming larger nodules. When examined with the microscope they are found to consist of a mass of cells undergoing a process of degeneration. In the center of the mass is a large multinucleated cell called the giant cell, from which there radiate fibres forming a network, in which are deposited epitheloid cells, large, small and polymorphonuclear leucocytes, fibrin, serum, albumen and granular debris. This entire mass is constantly changing, the process being called caseation, or cheesy degeneration, and is characteristic of all forms of tuberculosis.

Symptoms.—Since the pathology is not localized, there are no marked local symptoms in any particular organ. The disease begins with malaise, languor, lassitude, spinal aching and chilliness or a severe chill, which is followed by a rapid rise in the bodily temperature to 103 or 104 degrees. The fever is of the remittent type, having remissions daily exceeding two degrees; the pulse is rapid and feeble, the respirations are accelerated and shallow, the face is flushed, the tongue is heavily

coated and brown in color, the spleen is enlarged and tender, the urine is scanty and highly colored, and cerebral symptoms predominate.

The symptoms of the typhoid status supervene, and this is why this form is called the typhoid form of tuberculosis. Delirium is the most prominent and constant cerebral symptom, and may be accompanied at times by stupor, coma, carphologia, subsultus-tendinum or coma-vigil, the three latter symptoms being considered grave. The entire duration may vary from two to four weeks, and upon death will be found multiple tubercular cavities in the bones of the body and, also, in the soft structures. The cavities are filled with pus, the product of tubercular decay.

Acute Tuberculous Meningitis

Definition.—An acute suppurative inflammation of the meningitis of the brain and spinal cord, in which there is the formation of tubercles.

Adjustment.—Atlas in combination with C. P. and K. P.

Pathology.—The tubercles may be scattered throughout the entire meninges, and are of the same pathology as in the preceding variety. They are most numerous in the endothelium of the vessels of the meninges at the base of the brain, and for this reason the disease is sometimes called basilar meningitis. The meninges become thickened, swollen and nodular. They press upon the spinal cord, interfering with its function. Degeneration takes place within the tubercles, they giving off an exudation which accumulates in the intermeningeal spaces.

There is no definite nerve tracing to meningitis, as tenderness is very great in severity, and is so diffuse that it is called hyperæsthesia.

Symptoms.—The prodromal symptoms consist of anorexia, nausea, vomiting and general irritability. The head aches, the body loses flesh, sleep is poor, digestion is imperfect,

and after a duration of one to eight weeks, the fever is ushered in with a chill and rigor, or a severe convulsion.

The fever reaches 102 or 103 degrees and runs an irregular course, usually being of the remittent type. During this febrile stage the headache, which is usually occipital, is intense; the pulse is rapid and irregular, and hyperæsthesia along the spine is very marked; there are muscular contractions, cervical retraction and opisthotonus. The pupils are contracted; nystagmus, strabismus or ptosis may be present, and as a result of pressure upon the spinal cord by the swollen and nodular meninges, paralysis may occur. This paralysis may be in the form of a monoplegia, paraplegia or hemiplegia. Should the process of degeneration occur with great rapidity in the basilar meninges, an abscess of the brain will result, and death follow. The termination is with the symptoms of collapse, the breathing is of the Cheyne-Stokes type, and the duration after the rise in temperature is usually from two to four weeks.

Acute Miliary Tuberculosis of the Lungs

Definition.—An acute form of tuberculosis, in which there is the formation of miliary tubercles throughout both lungs.

Adjustment.—Lu. P., C. P. and K. P.

Nerve Tracing.—Tenderness is traceable from the tenth intervertebral foramen outward over the course of the tenth pair of spinal nerves, following a course along the intercostal spaces, under the axilla, and becoming diffuse over the anterior of the chest.

Pathology.—The tubercles form in the lining membrane of the terminal bronchioles and in the endothelium of the pulmonary vessels, and have the same microscopical pathologic consistency as that described under the general form. In the center of the tubercle is the giant cell, and accumulated in the meshes of the radiating fibres are found the epithelioid cells and the leucocytes. There is a thick, viscid secretion from the membranes affected.

Symptoms.—Preceding the onset, which is sudden, there may have been a chronic cough with scanty or absent expectoration, rapid breathing upon exertion, and slight pain in the chest.

The onset of the acute attack is always sudden, with a sensation of chilliness, and followed by a rapid rise in temperature to 102 or 104 degrees. The pulse is rapid and dicrotic, cough increases and is accompanied by muco-purulent expectoration, which is also very viscid and adhesive. The respirations are rapid and shallow, the face is flushed, cyanosis develops, the spleen is swollen and tender, and the leucocytes are increased in number. Upon inspection it will be found that the chest is sunken, the supraclavicular and infraclavicular spaces are large, the ribs approximate each other, the scapulæ project and expansion is deficient. An asthmatic hump may be observable in the upper dorsal region, a subluxation of the third dorsal vertebra will be found upon vertebral palpation, and tenderness is traceable from this point to the region affected. The duration may be brief, often lasting only one or two weeks.

Pneumonic Phthisis

Definition.—This is also called chronic catarrhal pneumonia, and is a catarrhal inflammation of the mucous membrane of the lungs in which there is the formation and caseous degeneration of tubercles throughout one or both lungs.

Adjustment.—Lu P., C. P. and K. P.

Nerve Tracing.—This is the same as the preceding form.

Pathology.—At the onset the tuberculous area may be limited to a small portion of one or more lobes of the lungs, and in the majority of cases is located in the apices of both lungs. The tubercles have the same pathologic consistency as previously described. They appear in the membrane lining the terminal bronchioles and the pulmonary arterioles.

The lung tissue between the tubercles is greatly congested, and gives off a catarrhal exudate, which has a tend-

ency to consolidate the air cells. The tubercles undergo a process of softening or caseation. This form of softening is also known as cheesy degeneration. The tubercles increase in number and area affected until the entire lung is involved, and it is not infrequent that the pleura is also involved by the tuberculosis.

Symptomatology.—This may be acute or chronic. The acute cases begin suddenly, with severe cough, muco-purulent expectoration and a high fever of 103 or 104 degrees, which is of the remittent type. There is anorexia, indigestion, emaciation, weakness and great shortness of breath. During the night there may be profuse sweats, followed by great exhaustion. This type may run a course of two to four weeks.

If the course is subacute the duration may be extended to one year. The fever is much lower, and is of the intermittent type, being present in the afternoon and evening only. There is more marked emaciation, cough, expectoration, deficient expansion of the lungs, night sweats, and hemoptysis.

The chronic form begins slowly, with a chronic bronchial cough that is very persistent and accompanied with a scanty muco-purulent expectoration. All attacks of coryza seem to settle upon the lungs, as the patient will say. Chills, fever and pain in the chest become prominent symptoms later, and blood-stained sputa is expectorated. Rales are prominent and will vary in kind with the extent of the bronchi affected.

Later the expansion is deficient, the chest becomes sunken, respirations are hurried and shallow, vocal fremitus is increased, and weakness becomes distressing. Emaciation has occurred to such an extent that the patient is unable to get around, and the night sweats and expectoration are very profuse. Duration is about two years.

Chronic Pulmonary Tuberculosis

Definition.—A very prominent incoordination of the lungs in which there are the formation and degeneration of tubercles, characterized by fever, cough and emaciation.

Adjustment.—Lu. P., C. P. and K. P.

Nerve Tracing.—Same as preceding forms in which the lungs are affected.

Pathology.—The tubercles are first formed in the apex of one lung, and that usually the right, after which they may spread, involving the major portion of one or both lungs.

The tubercle is of the same consistency as that in the other form of tuberculosis. It first appears upon the mucous membrane of the bronchioles or the endothelium of the arterioles as a grayish-white granulation about the size of a millet seed. In the center is the giant cell, which in a few cases is absent. Around the giant cell is a layer of epitheloid cells, which are always present and are characteristic of tuberculosis. Surrounding the layer of epitheloid cells are several layers of leucocytes, having different sized and shaped nuclei. Between these various layers of cells are fibres projecting in all directions, in the meshes of which are the cells and exudative material. The tubercle thus described then undergoes cheesy necrosis or caseation, in which the lung structure wherein the tubercles exist is destroyed. Several of the tubercles may unite, forming a tubercular nodule. The exudation accumulates in the cavities formed by the degeneration and is coughed up, at times being streaked with blood. If the tubercles are numerous and cover a large portion of the lung it may be rendered functionless, and is often spoken of as being "gone." However, cases so diagnosed have fully regained the function of such a lung under Chiropractic adjustments.

Symptoms.—The symptoms are divided into two stages, the incipient stage and the advanced stage. While in the incipient stage the disease is often called incipient phthisis, and while in the advanced stage, it is called chronic phthisis or consumption.

The incipient stage makes its onset insidiously, the patient being unable to recall when the first sign of the trouble began; in fact, he does not realize that he is the subject of tuberculosis until the symptoms are well advanced. Usually

the patient has had a chronic, dry cough of long standing, perhaps years, a poor appetite and general weakness. This weakness steadily increases, with languor, malaise, pallor of the face, and difficult breathing upon exertion. The cough is more pronounced during the morning, and is accompanied by a scanty, glairy expectoration. As the case advances the expectoration becomes more copious, the cough more frequent, and there may be hemoptysis, or at least the sputa will be blood streaked at times. On inspection it will be noticed that the chest expansion is diminished and that the ribs are close together. These symptoms are much more pronounced at a later period of the disease.

The advanced stage is marked by a severe cough, which is continuous throughout the day, but is more marked in the morning; profuse muco-purulent expectoration, which is often blood streaked, and at other times is greenish or gray; severe anorexia and vomiting. Hemoptysis, often large, from the erosion of a pulmonary vessel, is common during this stage. Pain in the chest is common when the tubercular inflammation affects the pleura, the pain being produced by the two inflamed surfaces of pleura being in contact during the respiratory movement of the lungs. The respirations are greatly quickened, the pulse is rapid, 120 to 150, the temperature varies from sub-normal to fever. The fever is one of the hectic type, being present in the afternoon and evening. Anemia develops, night sweats are very common, and are followed by extreme weakness. The cheek on the affected side is flushed, or both may be flushed; emaciation is marked and tubercular cachexia develops.

Upon inspection the clavicle, scapula and ribs are very prominent, giving rise to the characteristic phthisical chest. The supraclavicular and infraclavicular spaces are prominent and deep, the ribs are close together and the scapulæ project, making the patient stoop-shouldered; there is a rounding of the shoulders and a marked prominence of the upper dorsal vertebræ. Later the heart and kidneys become affected, pro-

ducing edema of the ankles, indicating venous stasis. If the affection is unilateral there will be an adaptative curvature of the spine in the upper dorsal region, whose concavity will be toward the affected side.

Because of the Lu. P. subluxation the lungs become tubercular. Function is abnormally expressed in them, the result of which is disease, and in this case the disease is tuberculosis. The adjustment of the vertebral subluxation at Lu. P. restores normal function to the lungs, giving to them more strength with which to carry on their normal work and increasing their resisting power to disease. As soon as function is expressed normally no waste metabolic material accumulates and undergoes degeneration, and that which has accumulated prior to the adjustment is readily absorbed and eliminated by the kidneys. K. P. is adjusted merely to make the kidneys stronger and more normal, so that they are able to meet the additional demand made upon them in the excretion of the poisons absorbed from the diseased area. Throughout the later stages of tuberculosis there is fever, which is the product of destructive metabolism. This is largely controlled by C. P., hence its adjustment in tuberculosis.

Fibroid Phthisis

Definition.—A form of tuberculosis which is localized in one lung, and whose area of degeneration is surrounded by a strong fibrous wall of connective tissue. This is also known as sclerosis of the lung and cirrhosis of the lung.

Adjustment.—Lu. P. and K. P.

Pathology.—This form of tuberculosis is unilateral and the tuberculous condition is localized in a small circumscribed area which is encapsulated in the dense growth of connective tissue. The area inclosed by the capsule of fibroid tissue is rendered functionless, hence the chest wall collapses.

Nerve tracing is the same as in other unilateral affections of the lung, the tenderness being traceable from the tenth intervertebral foramen on the affected side and leading out-

ward under the axilla, becoming diffuse over the area of the lung affected.

Symptoms.—The onset is very slow, and the incoordination runs a very long course, frequently 20 years.

The first symptom is cough, which is chronic and of long standing, being worse in winter and when aggravated by coryza, and absent or slight during the summer months. Later it becomes worse, is paroxysmal in character, and is accompanied by muco-purulent expectoration. The paroxysms occur with greater frequency during the mornings. There is dyspnœa upon exertion, and the chest expansion is greatly diminished on the affected side. Upon inspection the affected side is sunken, the shoulder becomes lower, and the spine is curved, the concavity of the curvature being toward the affected lung. The heart is displaced by the shrinking of the affected lung and the compensatory enlargement of the unaffected one. These symptoms gradually increase in severity with emaciation, weakness and pallor, and in the later stage, with irregular fever. Its long duration and unilateral character distinguish it from the other forms of tuberculosis.

Tuberculosis of the Peritoneum

Definition.—An inflammatory incoordination of the peritoneum, characterized by the formation and degeneration of tubercles.

Adjustment.—The adjustment must be made locally in the lumbar region, depending upon the location of the affected part, and will be determined by vertebral palpation. Also adjust K. P.

Pathology.—Tubercles having the same pathological consistency as previously described form upon the peritoneum and rapidly coalesce, forming large tubercular nodules. These nodules may be localized, covering a small portion of the peritoneum, or may be scattered over a large area, and form large nodules, which can be readily palpated, and in thin patients

these nodules can be seen, as they give to the abdominal wall an irregular shape.

Nerve Tracing.—The course of tenderness leads outward from the lumbar foramen, over the crest of the ilium, becoming diffuse over the nodules or the part of the peritoneum affected.

Symptoms.—These begin with abnormal sensations, possibly amounting to pain, in the abdominal region, and may be localized or general. The abdomen is tender under palpation, and is distended by gas. Digestion is affected by the tubercular nodules pressing upon the intestines, and gaseous distention; the bowels may be either constipated or there may be diarrhoea, emaciation is marked and gives to the abdomen an enormous appearance, as it is distended by gas and by an effusion of serum. The nodules are palpable and feel like tumor-like masses near to the median line of the abdomen. Adhesions form between the layers of the peritoneum affected and the intestines. The mesenteric and other lymphatic glands are enlarged and intraabdominal hemorrhage occurs when there is erosion of blood vessels by the tubercular necrosis. Finally the intestinal walls become involved, the intestine becoming obstructed and presenting the symptoms of acute intestinal obstruction. Toward the late stages there is fever ranging from 102 to 104 degrees, persistent vomiting, consisting of the contents of the stomach at the onset, later consisting of the bile, and finally of feces or bile having a fecal odor. With the fecal vomiting the symptoms of collapse appear, and death is sudden.

Tuberculosis of the Ureter, Prostate Gland and Bladder

If the ureter is the site of tubercular degeneration there is pain extending diagonally across the abdomen. The pain begins in the back around the kidneys, and this may be an extension of a renal tuberculosis. There is blood in the urine and also the presence of pus and destroyed epithelium. Casts of the ureter may be discovered and can be unraveled with needles when placed under water.

If the bladder is involved there is hyperacidity of the urine and great vesicle irritability. The urine is voided frequently and in small quantities, there is hematuria, and the destroyed epithelium from the bladder wall passes off with the urine. Pain is localized in the hypogastric region, and tenderness is diffuse over this region.

When the prostate gland is affected it becomes enlarged and presses upon the prostatic portion of the urethra and hinders urination. The gland can be palpated upon digital examination of the rectum and is found to be enlarged. Urination is slow and painful, and at times the urine may be retained in the bladder for an abnormal length of time, producing great discomfort to the patient. The pain is located immediately above the pubic bone and may be severe in the region of the rectum. When the bladder or prostate gland are involved the adjustment is the 4th lumbar and K. P.

When the testicles are affected they become immensely swollen, and may result in an erosion of the scrotum. They are painful and congested. Usually determined by the tuberculous diathesis, tuberculous cachexia, microscope and above symptoms. The adjustment is lower lumbar and K. P.

When the ovaries or fallopian tubes are affected the adjustment should be made at the third lumbar and K. P. There is pain in the inguinal region, accompanied by emaciation and enlargement of the adjacent glands. Fever may be slight and irregular, and the tubercular cachexia may develop. This may lead to abscess formation with the discharge of pus, which is blood stained, through the vagina.

Tuberculosis of the Cervical Glands

Adjustment.—Locally in the cervical region in combination with K. P. The local cervical adjustment restores the normal transmission of mental impulses to the cervical glands, which results in normal function. The excessive heat subsides and the process of degeneration is checked. The material that has already accumulated as a result of the previous destructive inflammation is gradually absorbed and

eliminated from the body through the various excretory channels, and the adjustment of K. P. assists in the rapid elimination of this.

Pathology.—In the early stages small gray granulations are present and may be visible to the naked eye. They gradually increase in size, becoming tubercles and undergoing a process of caseation. When a section is examined under the microscope the various histological structures of the tubercle can be plainly seen, consisting of the giant cell in the center and surrounded by the epitheloid and lymphatic cells. The giant cell is large and has many nuclei, the epitheloid cells are also larger than the leucocytes, and have a large vesicular nucleus.

Interlacing back and forth throughout this tubercle are fibres of connective tissue which extend to the periphery of its structure and form a surrounding capsule.

The tubercles first appear or form in the cortical substance of the gland, and as they increase in number the distinction between the cortical and medullary portions is lost. The entire gland becomes enlarged and indurated; tubercular nodules form and suppurate, and the pus thus formed frequently collects, forming an abscess, or is drained by a permanent sinus.

Nerve Tracing.—The tenderness is diffuse from the cervical foramen over the entire part of the neck affected.

Symptoms.—The submaxillary salivary gland is frequently the first to be affected, but in many cases the affection may be limited to the lymphatic glands, and the salivary glands remain unaffected. Of the cervical lymphatics, the first to be affected are the lateral and posterior chains, later and more rarely, the anterior group. At first they enlarge, become hard and are palpable. The enlargement steadily increases and they soon coalesce, becoming firmly matted together, and make the neck stiff or limit its motion. During the early stages, when the glands are separate, they will vary in size from the size of a white bean to that of an olive, but

after coalescing they form large masses, possibly as large as the hand. The affected glands usually undergo suppuration, the pus being discharged through a fistula or sinus externally, or it may be in such small quantities that it is absorbed and eliminated through the excretory apparatus.

The patient becomes emaciated and debilitated; the skin is pale, the eyes are pearly, and the tubercular cachexia finally develops. Irregular hectic fever with night sweats characterize the late stages of the affection.

Tuberculosis of the Kidneys

Definition.—An abnormal condition of the epithelium of the kidney, in which there is inflammation, and the formation and degeneration of tubercles.

Adjustment.—The specific adjustment in tubercular pyelitis or tubercular nephritis is K. P.

Pathology.—The tubercles, having the same consistency as those previously described, are located upon the mucous membranes of the pelvis, and of the uriniferous tubules. The tubules are obstructed and the mucous membranes are destroyed, portions of them being sloughed off and passed with the urine. If they coalesce the kidneys becomes immensely enlarged and nodular.

Nerve Tracing.—Tenderness can be found emitting from the lower dorsal foramen and becoming diffuse over the region of the kidney.

Symptoms.—During the early stage of the tubercular formation the symptoms are latent, but soon the condition is characterized by pain in the back over the region of the kidney, and is very tender upon palpation. Visceral palpation reveals an enlarged kidney, which may have an irregular shape. Urination is very frequent and the urine contains destroyed epithelium, pus, mucus and blood. In the later stages there are marked emaciation, debility, chills, irregular fever and sweats. The kidneys may finally become exhausted

and unable to excrete, the result being uremia, with coma and death.

Tuberculosis may occur in any part of the body, depending upon the part of the spine where the vertebral subluxations exist, the functions which they inhibit, and the relative degree of pressure which they produce. Tuberculosis often exists in the liver, spleen, mammary glands, suprarenal capsules, brain and spinal cord, and is frequently localized in bone.

Febricula or Ephemeral Fever

Definition.—A simple fever of a few days' duration, terminating by crisis from the first to eighth day.

Adjustment.—C. P. and K. P. The adjustment at C. P. decreases heat production and the adjustment at K. P. increases heat dissipation and elimination of poisons from the body. There is no localized pathology, hence no nerve tracing.

Symptoms.—The onset is abrupt, with headaches, flushed face, dry and coated tongue, excessive thirst, anorexia, nausea and vomiting. The fever may be preceded by a sensation of chilliness, after which it is of the continued type and varies from 100 to 105 degrees. The bowels are usually constipated, and the urine is scanty and highly colored, the skin is dry and hot, and there may be herpes labialis. If the fever is high, cerebral symptoms may be present, consisting of delirium and stupor.

The fever terminates by crisis within a week, or immediately upon receiving the proper adjustment.

Tetanus

Definition.—An acute febrile incoordination characterized by tonic spasms of the muscles, which steadily increase in intensity.

Adjustment.—Atlas, C. P. and K. P.

Symptoms.—The onset begins with headache, spinal pain and stiffness of the neck muscles, which symptoms are fol-

lowed by a slight rise in the bodily temperature. Later the temperature may become very high, reaching 106 to 108 degrees. The masseter muscle is affected early, and its contraction produces a condition known as lockjaw or trismus. If the risorius is contracted the risus sardonicus is produced. The head is drawn back, and later the contraction involves the entire spinal muscles, producing opisthotonus or emprosthotonus. Occasionally the respiratory and laryngeal muscles become tonically contracted, producing intense cyanosis.

Encephalitis Lethargica

Definition.—An acute febrile disease characterized by progressive lethargy, stupidity and stupor. It is also called the sleeping sickness, grippal catalepsy and epidemic coma.

Adjustment.—Upper cervical in combination with C. P. and K. P.

Pathology.—The structural changes are those of inflammation of various centers of the brain, the distribution of which is not constant. This begins with hyperemia of the cerebral vessels and a slow, vascular exudation of serum in the surrounding structure of the brain. With the effused serum there are many red and white cells infiltrated throughout the inflamed area and disorganization of the brain cells. Similar changes may extend into the cervical portion of the spinal cord, affecting principally the anterior horns.

Symptoms.—The most frequent and prominent symptoms are marked lethargy and stupidity. Usually there is fever in the early stages, the temperature ranging from 101 to 103 degrees. Often in cases that prove fatal the fever does not appear until the last stage. The patient grows more dazed and stupid and sleeps for days at a time unless great effort is made to arouse him from his stupor. In the initial stage there is pain in the eyes, vertigo, headache and diplopia. The patient often moves his arms around in a purposeless manner constituting a peculiar form of subsultus tendinum.

In the advanced stage the patient is unable to make any

voluntary muscular movement due to a complete general paralysis. The face becomes pale and because of the double facial paralysis has a peculiar mask-like expression. Delirium is common during the night, many cases chatter rapidly in a hysterical manner, indicating marked alteration in the mental state.

Before the development of the paralysis there is often muscular rigidity, pain and tingling in the extremities, later numbness and sensory paralysis develop. In fatal cases the coma is profound.

American observers lay great stress on the fact that at least 50 per cent of the cases in this country show a history of influenza and it is the opinion of Dana that it is but an aftermath of this disease. Grippal catalepsy is the name applied by the English to a similar disease which followed the epidemic of 1890. It did little harm, as has all similar outbreaks. Nona or la nona is the name applied to the same condition which appeared in Australia during the year 1889. Like all other appearances of the disease it followed influenza. The mortality in the American epidemic of 1918-19 was 15 per cent.

Anthrax

Definition.—A malignant form of localized serous poisoning of rapid course, characterized by fever and the formation of pustules.

Adjustment.—C. P., K. P. and local in the zone of the eruption.

Pathology.—The only pathological condition that exists in anthrax is the pustule, or elevation of tissue containing pus. The pustule usually forms upon or at the side of an abrasion of the skin and is inflammatory in character. The surrounding tissue is swollen and red, and the neighboring lymphatics are enlarged.

Symptoms.—This is also known as hostler's disease, rag picker's disease, wool sorter's disease and weaver's disease. There are two forms, the internal and external form. The

internal form is very severe and usually fatal, and begins with a sudden chill, followed by a rapid and high rise in the bodily temperature to 105 degrees. The pulse is rapid and weak; there is vomiting, diarrhoea, and extreme prostration. The patient passes into the typhoid status, with delirium, stupor and coma, and death results within 24 hours.

The **external form** begins with the formation and appearance of a small painful papule upon the skin, which grows in size at a rapid rate and forms a vesicle containing a bloody serum. This bloody serum becomes putrid and soon breaks, leaving a deep-seated ulcer situated upon a swollen and indurated base. Red lines radiate outward from the ulcer, following the course of the lymphatic vessels; the fever is high, prostration is great, the spleen is swollen; there are vomiting and diarrhoea, and in the severe cases are delirium, stupor and coma.

Cases that are fatal usually die between the fifth and eighth day, and those that recover begin to improve upon the sloughing of the ulcer, after which the fever subsides by lysis and strength is slowly regained.

Hydrophobia

Definition.—An acute febrile disease in which there is a morbid fear of water and a spasm of the muscles of deglutition.

Adjustment.—Atlas, C. P. and K. P. There is no localized pathology and no nerve tracing.

Symptoms.—The symptoms are divided into three stages, the initial stage, stage of excitement and stage of paralysis.

The **initial stage** begins with headache, mental depression, malaise, anorexia, insomnia, slight fever and difficulty in swallowing, after which there is the gradual merging into the second or excitable stage.

During this **second stage** the patient is restless and excitable, and the symptoms are increased upon noises and the sight of water. The skin is sensitive, and there is hypersensi-

tiveness of the special senses. The throat stiffens, and there are paroxysms of esophageal spasm of great severity, which is increased upon the sight or suggestion of water. With these paroxysms the breathing is difficult from the contracted respiratory muscles, and cyanosis results; there is delirium and maniacal excitement, but during certain intervals these cerebral symptoms may entirely subside, and in three or four days the patient passes into the paralytic stage or begins to recover.

In the paralytic stage the patient passes into a state of coma, with general muscular relaxation, and death occurs in a few hours or days.

Hydrophobia usually follows the bite of a rabid dog, wolf, fox, cat or cow, at which time poisonous toxins may be inoculated into the human economy, and because of poor elimination, due to vertebral subluxations at K. P., this poison has an injurious effect upon the body at large, as is manifested by the symptoms.

Lysophobia is a form of pseudo-hydrophobia found in hysterical patients who may have been bitten by a dog, but in which hydrophobia does not develop. It is a morbid fear of becoming rabid.

Gonorrheal Rheumatism

Definition.—A form of monarticular arthritis accompanying or following gonorrhea.

Adjustment.—K. P. and lower lumbar.

Pathology.—Gonorrhea is a catarrhal or exudative inflammation of the mucous membrane lining the urethra. In the early stages the mucous membrane becomes swollen and congested, and there is a profuse exudation of an abnormal or transformed mucus from the membrane. Later this mucus may become purulent and the mucous membrane become destroyed. In such a case, should the inflammation subside, the healing of the destroyed membrane may produce stricture. Gonorrheal rheumatism, or arthritis, only occurs

in those cases having the proper lumbar subluxation, which renders the articulation affected weak and unable to resist the effect of poisons which are absorbed from the inflammatory area of the urethra. This usually affects one of the larger joints, and usually the right knee joint. It becomes swollen, red and edematous. The swelling and tenderness is so great that movement is painful, hence suppressed. If the inflammation is prolonged, the synovial fluid becomes dried up, the synovial membrane becomes thickened, the periarticular cartilage is destroyed, the bone is deformed and the joint becomes stiff.

Symptoms.—Gonorrhea begins with a burning pain in the urethra, which is increased upon urination, and accompanied by a mucous or muco-purulent discharge. The dangerous practice of washing out the urethra with a syringe is frequently employed by those who know no better. This washes the pus up into the urinary bladder and prostate gland, the result being cystitis and gonorrheal prostatitis, in which the gland becomes chronically enlarged, constricting the prostatic portion of the urethra and pressing upon the rectum, from which much pain arises

The gonorrheal rheumatism or arthritis begins with severe aching pains in the joints, usually the right knee, accompanied by swelling, redness and marked tenderness. The swelling is edematous and the synovial pouches are distended with their secretion. The knee is made stiff to decrease the pain, which is so severe that the individual may be unable to walk. There may be slight fever present, with general febrile symptoms. Occasionally the effused serum around the joint undergoes suppuration, producing empyema of the joint. Very rarely the joint becomes permanently ankylosed through the false exostoses that form from the epiphyses.

This monarticular arthritis occurs because of the absorption of poisons from the gonorrheal inflammation in the urethra, which becomes localized in the weakened knee joint. The knee joint is made weak by a local subluxation in the

lower lumbar region. The correcting of the local subluxation in the lumbar region permits the normal flow of mental impulses to the tissues affected by the arthritis, whereby heat is restored to normal, the swelling and hyperemia disappear, and all pain in the incoordination subsides. The adjustment at K. P. increases the activity of the kidneys, so that all impurities in the body will be properly eliminated and cannot become localized elsewhere.

Many cases are on record that have recovered from acute gonorrhea in from one to ten adjustments, they being given every day or every other day. Cases of gonorrheal rheumatism usually require a longer time, but several cases have recovered in less than one month's adjustments.

In cases where the mucous membrane is destroyed by the inflammation and a stricture forms because of the scar forming, results can be obtained through adjustments. A case of five years' standing completely recovered from the stricture after two and one-half months' adjustments.

Syphilis

Definition.—A chronic incoordination of slow progress, characterized by an initial lesion, the chancre, and in the advanced stages resulting in a serous poisoning.

Adjustment.—K. P., lower lumbar and local, according to the zone in which the effect becomes localized.

Pathology.—The first abnormal structure to appear is the indurated chancre, which forms at the point where poison has been inoculated into the body. The tissue around the chancre becomes swollen and hard, and more or less inflamed. The surrounding lymphatics become enlarged, and later the skin becomes covered with various forms of eruptions, the most common of which is the syphilide, syphilitic acne, and the mucous patches on the mucous membranes of the mouth. Syphilitic periostitis often occurs early, and is characterized by the formation of bony nodes or exostoses appearing upon the shaft of the long bones, especially the tibia and clavicle.

In the tertiary stage syphilis may become localized in an organ or several organs and produce marked and various structural changes in the organs affected so that their normal function is lost. When located in the liver, spleen or other glands there is a marked increase in the amount of connective tissue of the organ, the capsule becomes thickened and the syphilitic gumma usually develops. This gumma has about the same pathologic consistency as the tubercle. In the center there is an accumulation of closely packed sunken cells, fat granules, cholesterol and a little fibrillated tissue. Surrounding this center there is a layer of epithelioid cells situated in the meshes of connective tissue fibres, and upon the outside, forming the third layer; there is an accumulation of leucocytes, with a few epithelioid and giant cells, all of which are surrounded by connective tissue.

In older gumma the substance is arranged into but two layers, an inner or soft layer and an outer or fibrous layer, which is dense and hard. Many of these small growths may coalesce to form a large nodular mass, which frequently softens and undergoes suppuration, with the formation of a yellowish pus.

In the late stages of the disease the poisonous effects may become localized in bone, producing syphilitic necrosis, in which large holes are formed in the bone. The same process of destruction may be localized in the skin and subcutaneous tissue, with the formation of large sloughing sores. The sore will appear to heal when a scab forms and the skin contracts, but upon washing the scab is softened and sloughs off, uncovering an accumulation of thick pus. When the sore does heal the scar remaining is similar to that of a burn. In the late stages the finger nails also become destroyed by onychia and are ragged, producing considerable discomfort to the patient.

In the tertiary stage the process of destruction may become localized in any tissue of the body, including the brain, spinal cord, intestines, liver, lungs, joints and bones.

Symptoms.—The symptoms can be divided into three stages, viz.: Primary, secondary, and tertiary. The initial or **primary** stage is characterized by the formation of a hard chancre occurring at the point of inoculation. This is usually upon the prepuce of the male or the vulva of the female. At the onset this chancre looks like a papule situated upon an elevated base, which is hard and indurated. The papule becomes eroded and forms an ulcer. The glands in the region of the ulcer become painlessly enlarged and hard, but decrease in size upon the healing of the ulcer, to again enlarge during the secondary stage.

Two or three months after the disappearance of the symptoms of the initial stage the symptoms of the secondary stage are manifest.

The **secondary** symptoms begin with constitutional disturbances consisting of a slight fever of 102 degrees or less, which runs an irregular course, and is accompanied by headache, backache, sore throat, general weakness, and a painless enlargement of the lymphatic glands of various parts of the body. Those of the groin enlarge first, and later the cervical, axillary, popliteal and other groups. The enlarged and hard glands remain separate, do not coalesce rapidly, and are not tender, all of which tends to differentiate them from tubercular glands. Then the skin becomes the seat of an eruption known as the syphilide, and consisting of small red spots, more noticeable after bathing with hot water. Later these spots become brown or coppery colored and may finally disappear, but sometimes remain permanent. In other cases the skin becomes covered with a papular eruption known as the syphilitic acne, which is most densely distributed over the face, neck and back. This eruption may last a variable length of time, and, upon healing, leave small pits or scars, which may have a brownish tint or color. The hair falls out in patches and the skin is dry, rough and intensely itchy. The nails become destroyed by syphilitic onychia, and frequently drop off or have ragged edges and bleed easily. Bony

nodules form upon the shaft of the long bones, due to a syphilitic periostitis. The node is composed of an exostosis and is most frequently found upon the anterior surface of the tibia and upon the clavicle. A scaly copper-colored syphilide nearly always appears upon the palms of the hands and the soles of the feet, and shreds or scales of skin can be peeled off from it. Anemia develops from the presence of syphilitic toxins in the blood and serum, and is marked by a yellowish or greenish-brown tint of the skin, known as syphilitic cachexia. The digestion is poor, insomnia is present and the patient undergoes great mental anxiety because of having contracted the dreaded disease.

The tertiary stage may not appear for many years after the disappearance of all secondary symptoms, the time varying from six months to twenty years. This is manifested when the amount of poison accumulated in the human system is very excessive, and because of local sublaxations diminishing the resistance of local organs will become localized in these weak organs. If the intestines are affected there will be the passage of shreds of destroyed membrane, with pus from the destruction of the mucous membrane. If the liver or kidneys are affected the result is amyloid degeneration of these organs, and when the brain is affected the result is dementia paralytica or general paresis of the insane. The spinal cord is frequently affected by the formation of gumma, and it is the gummatous formation in organs that produces the tertiary symptoms. This is most frequently located in the posterior part of the cord, thus producing pressure upon the sensory tracts, and may bring about a degeneration of these columns, the result being locomotor ataxia.

The terminal stage of most cases is marked by necrosis of various organs. From the ulceration of the larynx there may be parts of the laryngeal cartilages coughed up; the mucous membranes of the nose may be the seat of syphilitic rhinitis, giving off an intensely offensive odor (ozena), the bridge of the nose will become sunken and the septum entirely

destroyed. The necrosis of bone is localized, often affecting the face, in which case deep holes are eaten in the cranial and face bones. Sight is very often destroyed, either by optic atrophy, which occurs in a large per cent of cases, or by necrotic destruction of the eyeball. The patient becomes crippled, both physically and mentally, before death overtakes him, and he may remain in this state of deformity, blindness and decay for years before death.

Owing to the long duration and irregular course of syphilis and the newness of Chiropractic, reliable statistics of the results obtained cannot be given, but in many cases of the primary and secondary stages that have been adjusted the symptoms have disappeared, usually rapidly, and as yet no signs of the following stage or stages have appeared. There is no more loathsome disease than syphilis, and every precaution should be exercised to avoid it.

Gonorrhea being a catarrhal inflammation of the urethra and entirely different from syphilis, is readily overcome by adjustments in any stage. Many cases are on record, varying from one week to five years' standing, that have entirely recovered under pure unadulterated Chiropractic adjustments. The time required for either an acute or chronic case is variable, many acute cases having disappeared after a single adjustment, and most of them in less than two weeks' time. A chronic case of five years' standing, in which had developed a urethral stricture, making it necessary to use a sound in order to draw the urine, entirely recovered after receiving two and one-half months' adjustments. Although it may sound almost impossible, the stricture was entirely removed and urination was normal thereafter.

If the prostate gland becomes affected it enlarges and compresses the prostatic portion of the urethra, causing difficult urination and severe pain to the patient. Gonorrheal cystitis results when the pus is washed into the bladder, and produces even more distress than the gonorrhea itself.

SECTION 8

DISEASES OF THE DIGESTIVE SYSTEM

Stomatitis

Definition.—Stomatitis is an inflammation or excessive heat in the mucous membrane lining the mouth. There are five forms of stomatitis, viz.: Simple, ulcerative, follicular, thrush and gangrenous.

Simple Stomatitis, as its name implies, is a simple excessive heat affecting the mucous membranes lining the mouth.

Adjustment.—This form is produced by a subluxation at S. P. in combination with the middle cervical region, which impinges the nerves having to do with the transmission of the calorific function and produces perverted expression of this function, the result being termed inflammation or excessive heat. To restore the mucous membrane to normal it will be necessary to adjust the subluxations causing the trouble, viz., M. C. P. and S. P.

Pathology.—The excessive heat in the mucous membrane results in hyperemia and swelling of the part, with a slight exudation of a transformed mucus, serum and fibrin. These conditions are usually determined upon inspection of the mucous membrane of the mouth.

Symptoms.—The disease begins with redness, swelling and dryness of the mucous membrane of the mouth, and enlargement and dryness of the tongue, but may be limited to the membrane lining the cheeks and gums. The tongue is heavily coated and fissured, and has an offensive odor. There may be a slight fever, with the usual gastric disturbances. Because of the inflammation of the gums and tongue, masti-

cation and swallowing are very difficult, and are accomplished with considerable pain.

Under adjustment the excessive heat is restored to normal when the pressure upon the calorific nerves is removed, and all symptoms subside.

Aphthous or Follicular Stomatitis

Definition.—A form of stomatitis, characterized by the appearance of small white spots two to four mm. in diameter from the follicles of the mucous membrane.

Adjustment.—M. C. P., S. P. and K. P.

Pathology.—The mucous membrane becomes swollen, red, congested, and issues a white exudate from the follicles, at which place there was previously located a small vesicle with a red areola. After the vesicle breaks a small round ulcer is left, and it is from this ulcer that the exudate comes.

Symptoms.—The patient first experiences discomfort when the mucous membrane is covered by the small vesicles, which appear upon the inner surface of the lips, cheeks or tongue. After the vesicle breaks a small superficial ulcer remains, giving off the exudate, which is white in color. The bodily temperature may reach 100 or 101 degrees, the tongue may be coated, the breath have a fetid odor, and the patient's appetite be poor.

After a week's duration the ulcers finally heal and the symptoms disappear, but in some cases complications may occur which may protract the case beyond this normal limit of time.

Ulcerative Stomatitis

Definition.—A form of stomatitis marked by the presence of small linear ulcers, usually unilaterally, situated upon the mucous membrane of the gums, lips or cheeks.

Adjustments.—M. C. P., S. P. and K. P.

Pathology.—The gums are swollen, red and spongy, because of the excessive heat and hyperemia. The gums bleed

easily, and upon them form small linear ulcers, few in number and located upon one side of the mouth only. These ulcers are soft and slough off portions of the mucous membrane. The surrounding lymphatic glands may become enlarged.

Symptoms.—Upon observation it will be seen that the mucous membranes of the mouth are swollen and red, and that the gums are spongy, bleeding easily. Upon the mucous membrane may be seen one or more long, narrow ulcers having deep, sloughing bases and giving off putrefied material. The lymphatics draining the affected part may become enlarged, and also the lower salivary glands. The breath has a foul or fetid odor, the appetite is poor, mastication may be difficult, and gastric disturbances are usually present.

It is not uncommon for the teeth to become loose because of necrosis of the alveolar processes. Occasionally no symptoms, except the appearance of the ulcers, occur. This condition is usually recognized upon inspection of the mucous membranes of the mouth and does not need differentiation from other forms of stomatitis, as there are no other forms which closely simulate it.

Thrush

Definition.—A form of stomatitis, characterized by the presence of minute multiple white spots, which are situated closely together, and rapidly coalesce.

Adjustment.—M. C. P. and S. P.

Pathology.—There is inflammation of the mucous membrane of the tongue and mouth, with swelling and hyperemia. The exudation occurs first from the membrane of the tongue, afterwards spreading to the lips, cheeks, palate and pharynx, in the form of small white curd-like spots, which soon coalesce, and can readily be removed without leaving a bleeding surface.

Symptoms.—This form of stomatitis is the most common, and is usually found in bottle-fed children. The first indications are the appearance of the small white, curd-like

spots on the tongue, which soon spread to the other mucous membranes of the mouth and throat. These spots soon coalesce, but can be removed without leaving a bleeding surface. The child may be restless and refuse to nurse because of the soreness of the mouth, and, as a result, will become emaciated, pale and weak.

The main differentiation is from follicular stomatitis, and is briefly this: In thrush the spots are small, soon coalesce, and can be removed without leaving a bleeding surface, while in the follicular form the spots are larger, less numerous, and when removed leave a bleeding surface.

Gangrenous Stomatitis

Definition.—A form of stomatitis resulting in necrosis or decay of the mucous membrane and its surrounding tissues.

Adjustment.—M. C. P., S. P. and K. P.

Pathology.—As indicated in the definition, the pathology consists of an inflammation terminating in decay of the inflamed part.

Symptoms.—During the early stage the mucous membrane becomes red and swollen from the hyperemia. Later a dark sloughing ulcer forms upon the mucous membrane lining the cheek. This ulcer spreads rapidly, soon covering a large area. The skin externally is smooth and glossy, the breath has an extremely offensive odor, fever of 103 or 104 degrees is present, the appetite is poor, nausea and vomiting may be present, the pulse is rapid and weak, the respiration is rapid and shallow, and with the appearance of the dark gangrenous spot the fever becomes irregular, with great prostration. The muscles of the cheek may be perforated by the necrosis, after which it may extend, affecting the gums, jaw bones and the face in general. Particles of destroyed bone may slough off with pus, destroyed membrane and epithelium. The toxic symptoms soon predominate, with delirium, stupor and coma, with a fatal termination at the end of the first or during the second week.

Glossitis

Definition.—An inflammation or excessive heat of the tongue.

Adjustment.—In the great majority of cases a specific adjustment at S. P. will eradicate all symptoms of glossitis, but in a few cases it may be necessary to adjust M. C. P. and K. P.

Pathology.—The pathology is that of a simple inflammation consisting of excessive heat, which produces swelling, redness and hyperemia. The swollen mucous membrane gives off a thick, sticky, exudate consisting of transformed mucus. The swelling is the result of infiltration of serum, which occurs through a process of osmosis, and is not due to hypertrophy.

Symptoms.—The first noticeable symptom is the swelling of the tongue, with marked tenderness, making chewing, speaking and swallowing very painful. Therefore these acts are suppressed as much as possible. The swelling of the tongue, which is also very red, is so great that it is retained within the mouth with great difficulty, and may protrude beyond the lips. The tongue is usually dry and fissured, yet there may be excess secretion of saliva. As a result of the enlargement there may be obstructive dyspnoea, dysphagia and indistinct speech. Fever may be present or absent, the cervical glands are usually swollen, and the tongue may suppurate with pus formation, but, as a rule, the duration is about one week, after which recovery occurs. However, the inflammation may become chronic, in which case the tongue remains permanently enlarged because of the overgrowth of connective tissue. The sense of taste may be dulled or entirely lost, and the tongue is constantly coated.

The adjustment at S. P. relieves the pressure upon the calorific nerves leading to the tongue, permitting the normal transmission of calorific impulses to the tongue, whereby the heat is restored to normal and all symptoms subside.

Eczema or Psoriasis of the Tongue

Definition.—A cutaneous affection characterized by patches of rough scales, occurring in many forms, and sometimes affecting the mucous membrane of the tongue.

Adjustment.—S. P. and K. P. All mucous membranes have an excretory function, and when the kidneys fail to properly eliminate the various metabolistic poisons from the body, the mucous membranes and skin attempt to do so, in which event it often manifests itself as a skin eruption, and is capable of taking on different forms, one of which is eczema. Eczema can be eradicated from any part of the body by the adjustment of vertebræ, which will increase the excretory power of the body.

Symptoms.—It will be first noticed there is a hard spot upon the dorsum of the tongue, and in time this hard spot develops into a small scaly area, which progressively spreads from the center. There may be several patches, and when desquamation begins in the center of each patch and they spread around the edges, it gives to the tongue a peculiar appearance, known as the geographical tongue. The patches coalesce, burn and itch around the edges.

Leucoplakia Buccalis

Definition.—A chronic affection of the tongue and cheeks, characterized by the appearance of smooth, white, painless patches upon their mucous membranes.

Adjustment.—S. P. and M. C. P.

Symptoms.—A small white spot may appear without the patient's knowledge until he should see it, for it is devoid of any subjective sensation. Later the spot enlarges and becomes hard, being composed of an accumulation of endothelial cells. Ordinarily the condition does not become serious, but occasionally an epithelioma develops upon the site of the hard spot. When such is the case the symptoms developing are those of carcinoma.

Xerostoma

Definition.—An affection of the buccal and salivary glands in which the secretion of saliva ceases.

Adjustment.—Fourth cervical and S. P.

Symptoms.—This most frequently occurs in some disease of the salivary glands in which their secretion is suppressed, making the mucous membranes of the mouth dry. The membranes lining the buccal cavities and covering the tongue and palate become covered or glazed over with a heavy, sticky coating of abnormal mucus. This makes speaking, chewing and swallowing very difficult, as the tongue readily sticks to the roof of the mouth. The tongue may be fissured and cracked.

Acute Pharyngitis

Definition.—An acute inflammation or excessive heat of the mucous membrane lining the pharynx.

Adjustment.—Lower cervical in combination with S. P.

Pathology.—The local subluxation impinges the calorific nerves leading to the mucous membrane of the throat; this causes inflammation or excessive heat. The excessive heat produces muscular relaxation, which permits hyperemia of the vessels. There is an exudate from the congested vessels into the surrounding tissues, making them edematous and swollen. From the mucous follicles there is an exudation upon the external surface of the pharyngeal wall.

Nerve Tracing.—Tenderness is readily traceable from the lower cervical region, around the neck to the region of the throat, where tenderness is general.

Symptoms.—Acute pharyngitis is a very common affection, and is usually called sore throat, a cold in the throat, or catarrh of the throat. This begins with a sensation of dryness and soreness of the throat, dysphagia, slight chilliness, and fever. The fever may not exceed 101 or 102 degrees. there is a constant desire to clear the throat. The neck may become stiff, and the cervical lymphatic glands become en-

larged and hard. The mucous membrane is red and congested, as can be seen upon inspection, and the swelling interferes with swallowing and breathing. The inflammation may extend upward into the eustachian tubes, swelling the lining membrane so that hearing is affected, and there may be ringing noises in the head. The nasal catarrh may be increased in severity and the exudate drop into the pharynx during sleep, so that in the morning the patient coughs and expectorates much mucus.

When the inflammation becomes chronic it is called Clergyman's sore throat, and is accompanied by a chronic cough, constant clearing of the throat and hoarseness.

Retro-Pharyngeal Abscess

Definition.—As indicated by its name, it is an accumulation of pus within a pyogenic membrane, in the posterior wall of the pharynx.

Adjustment.—Lower cervical, S. P. and K. P.

Pathology.—This begins with a circumscribed area of inflammation in which the blood vessels are congested, and there is swelling, due to the infiltration of serum into the surrounding tissues. The effused serum and inflamed structures undergo suppuration or pus formation, the newly formed pus collecting in a cavity, which is soon surrounded by a membrane called the pyogenic membrane. This sac of pus may protrude anteriorly into the pharynx, where it can be observed to be of a reddish color at first, but later, when filled with pus, becomes white or yellow. Finally the abscess may burst into the pharynx, from whence the pus is expectorated.

Nerve Tracing.—The course of tenderness is very similar to that of acute pharyngitis, but is more localized over the region of the abscess.

Symptoms.—The onset is with sore throat and difficult swallowing. The throat is red, swollen and tender, and if the swelling is great breathing may be interfered with so that dyspnoea is present. There is cough and hoarseness, the neck

may become stiff, the cervical glands enlarge, fever of an irregular course be present, and upon inspection the abscess can be seen. It will be noticeable that the protruding abscess will fluctuate under pressure. From the mucous membrane covering the abscess externally there oozes a sticky, thick exudate in large quantities, making it difficult for the patient to expectorate same and impossible to swallow. There may also be a throbbing pain in the throat, which suddenly stops when the abscess breaks.

Follicular Tonsillitis

Definition.—An inflammation or excessive heat in the tonsils, with a slight amount of suppuration occurring within their follicles.

Etiology.—Subluxation at lower cervical and S. P., but K. P. should also be included in the adjustment, as metabolistic poisons are being formed, and can better be eliminated when the kidneys are working at par.

Pathology.—The tonsils become swollen and sore from the excessive heat. The vessels are hyperemic, and a vascular exudation occurs into the surrounding tissues, so that the entire throat is greatly swollen. Suppuration of a slight degree occurs within the follicles of the tonsils and gives off a yellowish exudate, which collects upon the inflamed tonsil, forming a patch. At first this exudate appears as small spots, but they soon coalesce, forming patches which may cover the entire tonsil.

Nerve Tracing.—Tenderness is traceable from the lower cervical foramen, outward over the skin of the neck to the region over the tonsil, in front of and below the angle of the jaw. Also tenderness is sometimes found from the 13th or 14th intervertebral foramen on the right side, passing outward under the scapula and axilla, and then upward over the breast, beneath the clavicle and along the neck to the region of the tonsil.

Symptoms.—The onset is sudden, with chilliness and a rapid rise in the bodily temperature, often reaching as high as

105 degrees, but is more often about 102 degrees. There are intense headache and backache, and more or less general aching. The appetite is soon lost, and vomiting of a persistent character may be present. The throat is sore, red and swollen, so that swallowing is painful and avoided as much as possible by the patient. The urine is scanty and highly colored, the bowels are costive, the tongue is coated, the breath has a foul odor, and the voice is nasal in character.

Upon the second or third day small white or yellowish spots will be seen oozing from the follicles. These spots soon coalesce to form a large patch, which covers the entire tonsil. This exudate has a very offensive odor, but is finally sloughed off with the expectoration. The fever falls by crisis between the third and eighth day, with profuse sweating and rapid recovery. During the attack the patient may have lost much weight, but this is gained at a very rapid rate. During the fever the pulse and respiration were rapid, but with the fall of the fever they both become more slow and approximate the normal.

Suppurative Tonsillitis or Quinsy

Definition.—A form of tonsillitis in which there is a marked degree of suppuration, the entire tonsil being transformed into an abscess.

Adjustment.—Lower cervical, S. P. and K. P.

Pathology.—The tonsil, usually only one, becomes congested and swollen because of the excessive heat. The swelling may extend far back, affecting the naso-pharynx, eustachian tube and fauces. The substance of the organ undergoes suppuration near to its center, so that the covering of the tonsil forms the covering for the abscess into which it is transformed. The abscess usually breaks about the sixth to ninth day, after which the swelling subsides.

Nerve Tracing.—The same as that for follicular tonsillitis.

Symptoms.—The onset is marked by general malaise, sore throat, headache, backache, aching in the extremities, and

general indisposition. The appetite is poor, the mind is dull, and the individual is not alert as usual. After prodromal symptoms of one or two days the throat becomes swollen and very red. The affection, however, is unilateral, so that the swelling is confined to one tonsil. The affected tonsil may extend beyond the median line of the throat, and is so tender that swallowing is impossible. The pressure of the abscess against the eustachian tube will affect the hearing, and possibly produce earache. There is a thick, sticky exudate that oozes from the inflamed tonsil, and which is removed with great difficulty and much pain to the patient, but affords great relief for a short time after its removal. There is a throbbing pain, occurring with each pulse beat. The uvula and soft palate may be involved in the swelling, thus affecting the voice. The cervical glands are often swollen, and the neck is stiff. The fever, which appears early, varies from 101 to 105 degrees, and has an irregular course. The patient usually does not eat for several days preceding the bursting of the abscess, because of the intense pain produced upon doing so. Between the sixth and eighth days the abscess breaks anteriorly into the mouth, after which the pain subsides and recovery is rapid.

Under Chiropractic adjustments this may never reach the abscess stage, because of absorption and elimination through other channels, and if an abscess does form it will break at an earlier period when under the adjustments.

Chronic Tonsillitis

Chronic tonsillitis is a prolongation or continuance of the acute forms. Recurrent tonsillitis is a condition in which there are many recurring acute attacks, and has the same symptoms as the acute form previously described.

Pathology.—Chronic tonsillitis is commonly associated with chronic pharyngitis, and when the glandular structure is subjected to excessive heat for a long period of time there is a proliferation of the connective tissue corpuscles and a hyperplasia of the interstitial connective tissue of the organ, making

it chronically and permanently enlarged. The symptoms that may arise are mouth breathing, because of obstruction of the naso-pharynx, and a nasal tone to the voice.

Adenoids

Definition.—An overgrowth of adenoid or lymphoid tissue, usually in the naso-pharynx.

Adjustment.—Local in the cervical, depending upon the location of the growth, in combination with K. P.

Pathology.—In this incoordination there is an abnormal and overdevelopment of the lymphoid tissue in the part affected, so that one or more small lymphoid tumors are formed. These growths deprive the surrounding tissues of their nutrition, have an abnormal relation to the tissues adjacent, and are incapable of performing the function of the gland they imitate.

Symptoms.—The first symptom to attract the attention of the observer is that the child breathes through the mouth when sleeping, and later during waking hours. The nostrils are small, and dilate with inspiration, the bridge of the nose is very broad, and the lower jaw protrudes so that the lower teeth may extend in front of the upper teeth. Breathing becomes difficult, the sense of taste and smell are impaired, there is a hawking cough, accompanied by a scanty expectoration, and hearing may be affected. The deafness is the result of pressure by the adenoid upon the eustachian tube, which prevents the normal passage of air into the middle ear. The child is often mentally dull and unable to concentrate, but this is because he is unable to hear; the eyes may be affected by the M. C. P. subluxation, and these two gateways of knowledge being shut off, the child has but the sense of taste, smell and touch through which to gain knowledge. Since smell and taste are impaired, the only normal sense is that of touch, and an individual depending entirely upon this one sense for impressions which, when interpreted, result in knowledge,

would naturally be dull mentally, and forget easily because of improper comprehension.

Acute Esophagitis

Definition.—Is an acute inflammation or excessive heat in the mucous membrane lining the esophagus.

Adjustment.—Since this is caused by pressure upon a calorific nerve by a subluxation at S. P., the adjustment would be specifically given at S. P.

Pathology.—The mucous membrane becomes red from the hyperemia, and swollen from the exudation of serum which becomes infiltrated into the surrounding tissues. There is catarrhal exudate of abnormal mucus from the free surface of the lining membrane.

There is no specific nerve tracing in esophagitis, as the esophagus lies behind the sternum and trachea, and since it is frequently associated with gastritis, tenderness may be traceable from S. P. to the region over the stomach.

Symptoms.—These begin with dryness and extreme thirst, followed by deep-seated substernal pain. There is extreme dysphagia upon swallowing, and soreness of the throat. Upon inspection of the throat it will be seen that the pharynx is inflamed and red. There is tenderness over the region of the stomach and around the throat, and if the esophagitis is associated with gastritis, there is the presence of gastric disturbance.

Cancer of the Esophagus

Definition.—An accumulation or growth of epithelial cells upon the mucous membrane of the esophagus, in which there is progressive inflammatory destruction and colloid degeneration.

Adjustment.—S. P. and K. P.

Pathology.—This is most commonly carcinoma, and is composed of epithelial cells, therefore is derived from the hypoblast or epiblast. The cells are of all shapes and are sit-

uated upon a fibrous stroma which sends out projections in all directions, upon which are built the epithelial cells. The blood vessels and lymphatics are found only in this stroma, and communicate with the cancer cells through the stroma only. The growth of the tumor occurs from the base, so that the apex of the growth is composed of the oldest cells. It is in these first-formed cells that degeneration takes place, they undergoing a form of decay. The most common form of degeneration found in cancer is colloid degeneration, but other forms, such as mucoid, fatty or pigmentation may occur.

Symptoms.—While the growth is small and contains no decay the only symptoms present are pressure symptoms. The first to become noticed is dysphagia, due to partial obstruction of the esophagus, so that the food cannot easily pass into the stomach.

The dysphagia is progressive in character, and is accompanied by pain as soon as the degeneration begins. The pain is of a dull, burning, gnawing or itching character. The breath has a foul odor, the tongue may be coated, the body undergoes progressive emaciation, the cervical glands may become enlarged, and the food may regurgitate into the pharynx. The cancerous cachexia soon develops, hemorrhages may occur from the growth because of the erosion of blood vessels, and finally the growth may become so large that complete stenosis is produced. On account of the inability to swallow, the patient becomes greatly emaciated and weak, and finally dies.

There may be a partial obstruction or stricture from other pathological conditions, such as the cicatrix of a healed ulcer, a benign tumor, pressure upon the esophagus by a tumor of the mediastinum, or tumor of the lung, all of which will present the pressure symptoms named above, but the characteristic pain, cachexia, emaciation and debility, and lymphatic enlargements will serve to distinguish cancer from them. Dilatation or diverticula of the esophagus frequently accompanies obstruction by cancer or obstruction by other causes.

Dilatation of the Esophagus

Definition.—A stretching of the muscular walls of the esophagus, either localized or general, so that the food is retained and regurgitated at irregular intervals.

Adjustment.—S. P.

Pathology.—Below the point of the dilatation there may be a partial obstruction, but this is not essential. The S. P. subluxation impinges the motor nerves leading to the muscular fibres of the esophageal wall and causes a lack of muscular tonicity and elasticity, so that when food is being forced down into the stomach and presses upon the esophageal wall it tends to stretch these muscle fibres. The condition being prolonged for many months, and the stretching continuing slightly each day during this time, it will soon develop that a saccular dilatation has formed in the wall of the esophagus. Such a saccular dilatation is known as a diverticulum, and most commonly forms at the upper end of the esophagus, where it joins with the pharynx.

Symptoms.—This condition is often found in fast eaters, and may be adaptative to stricture or stenosis. When the relaxation of the muscular fibres in the esophageal wall is so great that a sac is formed, the patient realizes that a part of the food being swallowed lodges on the way down. This sac may be formed at any point in the esophagus, but, as previously stated, is most commonly at the junction of the esophagus with the pharynx. When the food accumulates in a sac at this point a visible or palpable tumor forms above the clavicle, and when pressed upon, the food that has collected here is forced into the pharynx. When located lower there is regurgitation of food at irregular intervals, the quantity varying with the size of the sac. The regurgitated material is in a state of fermentation and is covered with froth. X-ray pictures after eating apple sauce containing bismuth will show the outline of the diverticulum.

Acute Catarrhal Gastritis

Definition.—Is an acute inflammation or excessive heat in the mucous membrane lining the stomach, and is accompanied by an exudation from its surface, disturbances in the secretion of the gastric juice, and disordered digestion.

Adjustment.—This is caused by an S. P. subluxation, which impinges the calorific nerves leading to the mucous membrane lining the stomach, and results in perverted expression of this calorific function, known as inflammation or excessive heat. The adjustment may also include K. P.

Pathology.—The inflammation or excessive heat brings about a relaxation of the muscular fibres forming the vessel walls, so that their lumen is increased in size and the blood accumulates in excess quantity, giving rise to hyperemia or congestion. This gives to the mucous membrane a red appearance. From the hyperemic vessels there is a slow vascular exudation of serum which becomes infiltrated into the surrounding submucous areolar tissues, producing a swelling of the stomach wall. The mucous membrane gives off a slimy, abnormal mucus of a catarrhal nature, which is more or less adherent to the mucous membrane, and removed during the act of vomiting.

Nerve Tracing.—Tenderness is traceable from the 13th or 14th intervertebral foramen on either side and radiates along the course of the intercostal nerves, becoming diffuse over the epigastric region.

Symptoms.—This begins suddenly, usually after eating a hearty meal, with severe headache, epigastric distress, and a feeling of fullness and discomfort. Pain may be severe, but is usually dull and aching. The abdomen becomes distended from the gas formed in the stomach, but later this gas is belched up. There are nausea and vomiting—the vomitus consisting of undigested food, mucus exudate, and finally bile. The tongue is furred and the breath has an offensive odor, the secretion of saliva is increased, and there is often a slight fever of 102 to 103 degrees, with scanty, high-colored urine,

a costiveness, and some cerebral symptoms, such as delirium, stupor, and possibly coma. Chemical analysis of the contents show that the gastric juice is of an abnormal quality, as the HCl is diminished and there is the presence of lactic and acetic acid. Convulsions may occur in children, but are rare in adults, while the cerebral symptoms are not common in children. Severe purging may also occur, but is not a constant symptom.

The adjustment of the subluxation at S. P. will relieve the pressure upon the calorific nerve and restore the normal transmission and expression of calorific impulses in the mucous membrane lining the stomach, thereby restoring normal function of the organ and the disappearance of all symptoms indicating incoordination.

Chronic Catarrhal Gastritis

Definition.—A chronic inflammation of the stomach characterized by disturbed digestion, in which there is increased abnormal mucus formation, changes in the character of the gastric juice, and weakness in the walls of the stomach, so that food is retained within the stomach for an abnormal length of time and undergoes fermentation.

Etiology.—This is caused by the S. P. subluxation, which impinges the nerves leading to the stomach and affecting the expression of the calorific and motor functions, so that the mucous membrane is inflamed and the muscular coats lose their tonicity. Since this is a catarrhal inflammation, K. P. should be adjusted to increase the excretory power of the kidney, thus assisting in eliminating products of fermentation that have been absorbed.

Pathology.—During the early stages the pathology is the same as that of the acute form, consisting of hyperemia, swelling, and an abnormal exudation of mucus, but the prolonged inflammation soon produces other structural changes. Among these might first be mentioned the overgrowth of the sub-mucous areola tissue, which increases the thickness and lessens

the elasticity of the stomach wall. The secretory cells become enlarged, either from the retention of their secretion or from proliferation of the connective tissue. The muscles become relaxed because of a loss of their tonicity, and become stretched, giving rise to dilatation of the stomach. These various changes may affect the entire organ or may be limited to a part of the mucous membrane, especially that part around the pyloric opening.

Nerve Tracing.—The origin and course of tenderness is the same as in the acute form, and tenderness may be very marked and diffuse over the region of the stomach. In addition to this there may be tenderness over the region of the duodenum, for in many cases there exists a gastro-duodenitis.

Symptoms.—The patient may have had repeated attacks of acute indigestion preceding the development of chronic gastritis. The symptoms are very variable, depending upon the degree of pressure and the extent of incoordination that it produces. There are usually headache, vertigo, insomnia, restlessness, drowsiness and lassitude. The appetite is changeable, but is usually poor, and after eating there is a feeling of epigastric fullness, distress or oppression. Pyrosis or heartburn is common, and may be accompanied by regurgitation of bitter fluid and gas. There is an accumulation of gaseous formation in the stomach and intestines, which causes great discomfort and distention of the abdomen. Tenderness is diffuse over the epigastric region, the tongue is heavily coated and fissured, there is a bad taste in the mouth, the urine is scanty and highly colored, and there is weakness and emaciation. The gastric symptoms consist principally of anorexia, nausea and vomiting. The vomitus consists of partially digested food and gastric juice. It has a fetid odor, as it is in the process of fermentation. Chemical analysis of the gastric juice shows the HCl is greatly diminished below the .2%, and that there is the presence of lactic and acetic acids. At times the vomitus may contain small quantities of blood that has lost its color and undergone partial digestion. The pain is of dull

character, but may be severe and gastralgic at times; it is not localized, but may be felt over the entire region of the stomach. The course of the affection is irregular and the duration is long, as compared with ulcer and cancer. In the late stages the entire mucous membrane is destroyed from the effect of the prolonged excessive heat, and the secretion of the gastric juice may be entirely stopped, as there has been a granular degeneration of the secreting cells.

Peptic Ulcer

Definition.—A local, circumscribed destruction of tissue, involving the mucous membrane and usually one or more layers of the wall of the stomach, characterized by epigastric pain and disordered digestion.

Adjustment.—This is caused by a local subluxation at S. P., but K. P. should be included in the adjustment, as various poisons may be absorbed from the ulcerated area.

Pathology.—Ulcer of the stomach is usually single, and most frequently located near the pylorus on the posterior wall of the stomach. It is usually small, being from $\frac{1}{4}$ to $\frac{1}{2}$ inch in diameter and round in shape. As it approaches the muscular layers of the stomach wall it becomes narrow and tapers down to a point, thus giving the entire ulcer a cone shape, with the base in the mucous membrane and the apex in the muscular layers. As the ulcer progresses in size it effects the erosion of blood vessels that may lie in its path, thus giving rise to profuse hemorrhages, the blood of which is soon vomited. A few cases perforate. The ulcerated tissue may later heal by proliferation of the connective tissue corpuscles, so that connective tissue replaces the destroyed epithelium of the stomach wall.

Nerve Tracing.—Tenderness is very marked over the exact location of the ulcer any may be limited to a very small area. It is traceable to the intervertebral foramen of S. P.

Symptoms.—During the early stages the symptoms resemble those of acute dyspepsia, there being epigastric dis-

comfort and pain after eating, accompanied by gaseous formation and sometimes vomiting. As soon as the ulcer develops there is severe gastralgic pain occurring in paroxysms, and is more severe after eating than when the stomach is empty. If the ulcer is located on the anterior wall of the stomach the pain is felt in the epigastric region, and may be relieved by lying upon the back, while if the ulcer is located in the posterior wall of the stomach the pain is felt near the level of the tenth dorsal vertebra, and may be relieved by lying upon the face. The pain is usually relieved by vomiting, as the food and the acid secretion of the gastric juice irritate the raw ulcerated tissue. The area of tenderness is often very small and can be covered by the tip of the finger. The vomitus often contains blood. If the hemorrhage from the ulcerated tissue is small the blood lies in the stomach and undergoes partial digestion, so that it loses its oxygen, hence has a dark color, so that when it is vomited it resembles coffee grounds; therefore it gets the name coffee-ground vomit. However, if the hemorrhage is large the blood is vomited at once and is of a bright red color and has a strong acid reaction. This bright red vomit is called hematemesis. Chemical analysis of the gastric juice shows a marked increase in the quantity of HCl secreted by the gastric glands. This strong acid secretion keeps the surface of the mucous membrane in a constant irritable and raw state. There may be marked emaciation and weakness from the loss of flesh.

If the ulcer should be situated directly in the pylorus and should heal, there may result a cicatrical stenosis, or if a series of ulcers should form near the center of the stomach and heal, the result may be the hour-glass stomach, where it is constricted in the center and dilated at each end.

In case the ulcer should lie in the duodenum there is pain in the right hypogastric region, and the pain is increased in paroxysms two to four hours after eating or when the chyme from the stomach enters the duodenum and presses upon the sore ulcer. The patient becomes emaciated, anemic and

generally run down. Ulcers differ from chronic gastritis in that the course is more rapid, the gastric juice is overacid, there is hematemesis, and the tenderness is localized at one point. In chronic gastritis there is hypochlorhydria, diffuse tenderness, dull pain, slow course, and no hematemesis.

In cancer the vomitus is of the coffee-ground variety, the pain is dull and gnawing, emaciation and cachexia are marked and rapid, and the tumor may be defined upon abdominal palpation. The gastric juice is lacking in HCl, while in ulcer the HCl is in excess, the pain is gastralgic, pain and tenderness are localized, and there is hematemesis.

Cancer of the Stomach

Definition.—An incoordination in which there is the formation of an epithelial tumor upon the stomach wall, in which there is progressive degeneration, and characterized by pain, disordered function and coffee-ground vomit.

Adjustment.—S. P. and K. P.

Pathology.—The growth is usually a carcinoma, and is differentiated from sarcoma as follows:

CARCINOMA

Derived from epiblastic and hypoblastic structures; an epithelial tissue growth.

Possesses a fibrous stroma.

Blood vessels run in this stroma.

Lymphatics run in this stroma.

SARCOMA

Derived from mesoblastic structures; a connective tissue growth.

Has no stroma.

Vessels run in direct contact with the cells.

Has no lymphatics.

The tumorous growth begins in the gland cells of the mucous membrane and accumulates in excessive quantity

until a small tumor is formed. This tumor gradually increases in size and soon undergoes degeneration. The cells first formed are the first to be affected by the decay and they slough off as a purulent discharge. The growth is most frequently located at the pyloric end of the stomach, and it is not infrequent that a growth thus situated produces obstruction of the pylorus, with a resulting dilation of the stomach. If the growth attains a large size, the added weight may draw the stomach downward and adhesions may occur, in which the mucous membranes are grown together, or in which the stomach may become adherent to other abdominal viscera.

Nerve Tracing.—Tenderness is traceable from the 13th or 14th intervertebral foramen on the right side, outward under the scapula and axilla, following the intercostal spaces to the right hypochondriac region, and becoming diffuse over the region of the cancer.

Symptoms.—So long as the growth is so small that it cannot produce pressure symptoms and there is no suppuration occurring in its tissues, the symptoms are latent. But as soon as it increases in size it will produce pressure symptoms in the region where it occurs, and as soon as there is suppuration the typical symptoms of cancer begin to be apparent. This is first manifested by a feeling of oppression and discomfort in the epigastric or right hypochondriac region, which is increased after eating. There is anorexia, nausea and vomiting, and belching of gas after meals. As a rule, the bowels are constipated and the fecal matter has a fetid odor. A dull, aching, gnawing, itching pain, which is characteristic of cancer, is located in the region of the growth, and may radiate along the course of the nerves to the spine. There is marked tenderness over the epigastric region, which may be so great that it is impossible to palpate the abdomen, but when the abdomen can be palpated a tumor may be felt, especially if it be located in the pylorus or on the anterior wall of the stomach.

The vomiting becomes very marked after eating, and soon takes on a characteristic form peculiar to cancer of the stomach—that is, the coffee-ground vomit. This is produced by the effusion of small quantities of blood from the destroyed vessels into the stomach, which is retained here and undergoes partial digestion, so that the red color is lost from the loss of oxygen. Chemical analysis of the gastric juice shows diminished or absent HCl and the presence of lactic and acetic acid.

The patient becomes greatly emaciated and of a sallow color, due to the development of the cancerous cachexia. The muscles become thin and weak, the skin assumes a yellowish color, the appetite is completely lost, the pylorus may become completely obstructed, the stomach may dilate, and death soon will occur.

The cardinal symptoms of gastric cancer are, progressive emaciation and loss of appetite, dull gnawing pain localized in the region of the stomach, coffee-ground vomit, in which the HCl is absent or diminished, a palpable tumor and dilation of the stomach, with the development of the cancerous cachexia.

For differentiation from ulcer see peptic ulcer in the preceding topic.

Cancer differs from chronic gastritis, in that the duration is comparatively short, death occurring within one to one and one-half years; the tumor is palpable, the vomit is of the coffee-ground variety, the cancerous cachexia soon develops, the pain is dull and gnawing, and is not relieved by eating, as is gastritis.

Hypertrophic Stenosis of the Pylorus

Definition.—A condition in which there is a thickening of the muscular coats of the pylorus, causing a stenosis or obstruction of the opening into the intestine.

Adjustment.—Lower S. P. specifically.

Pathology.—The muscular and connective tissue of the pyloric orifice is thickened by hypertrophy of the cells, so that the bulk of tissue is increased and the lumen of the opening is compressed and made smaller. There is no form of degeneration or decay present, this being a simple hypertrophy of the part.

Symptoms.—The pyloric opening being obstructed, the food is unable to pass from the stomach into the intestines. This gives rise to a feeling of epigastric fullness and discomfort, with anorexia, nausea and vomiting. The abdomen is distended and the stomach may be outlined upon percussion. If the obstruction is of long standing and food is being forced into the stomach, the walls will be forced to stretch, so the dilatation is soon produced. The symptoms of dilatation supervene.

Dilatation of the Stomach

Definition.—An incoordination in which there is a relaxation of the walls of the stomach and an increase in the size of its cavity, characterized by decomposition of the food, and paroxysmal vomiting.

Adjustment.—S. P. is the specific adjustment.

Pathology.—Dilatation of the stomach may be either atonic or obstructive. In the former the local subluxation causes an impingement upon the motor nerves, conveying motor impulses to the muscular fibres of the stomach wall, preventing these muscles from obtaining sufficient impulses to keep the muscles in normal tonicity, hence their relaxation and consequent dilatation of the stomach. In the other form there is an obstruction occurring at the pyloric opening, which may be in the form of a growth; pressure from the outside, as in tumor of the head of the pancreas, or from hypertrophic stenosis. The opening being closed and food accumulating within the stomach, the abnormal weight will tend to stretch the stomach wall, so that the final result is dilatation.

Symptoms.—The abdomen over the region of the stomach is tender, and this tenderness is traceable back to the spine at the region of S. P. There is a feeling of fullness and distress in the epigastric region, with eructations of gas and bitter fluid. The appetite is usually good, but there may be anorexia in some cases, or at times in all cases. The bowels are constipated and the urine is scanty. The patient becomes emaciated and weak, the skin is dry, and there is excessive thirst. This extreme thirst is adaptative to assist in washing small particles of food through the partially obstructed opening of the pylorus. Vomiting is the most characteristic symptom, and it has a peculiar paroxysmal regularity not found in other diseases. This vomiting occurs every two or three days, depending upon the extent of the dilatation and the size or capacity of the stomach. At the period of vomiting large quantities of partially digested or undigested food are emptied from the stomach. In some cases as much as two or three gallons is vomited, and when permitted to stand will separate into three distinct layers. The upper layer consists of a brownish gray froth, indicating the presence of fermentation or decomposition; the middle layer consists of the dark fluid, the gastric juice and liquid food that have been taken into the stomach, and the bottom layer consists of a sediment of undigested food. This vomit is of an acid reaction, has a fetid odor, and continues periodically as long as the obstruction to the pylorus exists.

Upon inspection it will be seen that the abdomen is distended, and splashing sounds can be heard by placing the ear in contact with the abdominal wall over the region of the stomach.

Emaciation and debility are marked because of improper nutrition, and the patient finally yields to extreme weakness.

The adjustment restores normal motor tonicity to the muscular fibres forming the stomach walls, whereby peristaltic motion is regained, the cavity of the stomach becomes normal and symptoms subside.

Neuroses of the Stomach

A neurosis is a condition in which the function of a part is abnormal, but in which there is no discoverable pathological change in the structures of the part affected. This is undoubtedly because the functions affected are such as will not produce structural changes, or that the degree is so slight that the change cannot be seen.

There are four neuroses of the stomach, but many authorities recognize five, as follows: Hyperchlorhydria, hypochlorhydria, hypersecretion, gastralgia and nervous dyspepsia. The latter is a general term that may include any or all of the first four.

Hyperchlorhydria

Definition.—An abnormal condition of the stomach in which there is an overabundance of HCl in the gastric juice.

Adjustment.—This is caused by pressure upon the secretory nerves emitting from the 13th or 14th intervertebral foramen and leading to the secretory cells of the gastric glands. The pressure is produced by a local vertebral subluxation at S. P., and by adjustment of this subluxation the pressure is removed and the flow of impulses to the secreting cells becomes normal, so that the character of the secretion is restored to normal.

There is no pathological or structural change occurring in any of the neuroses.

Nerve Tracing.—The tenderness is traceable from the region of S. P. on either side and follows the intercostal spaces to the epigastric region, becoming diffuse over the region of the stomach.

Symptoms.—During intervals the patient may experience no symptoms, but at times, and especially after eating, there is a feeling of discomfort, which later develops into a burning pain. This burning pain is produced by the overacid juice

coming into contact with the delicate and sensitive mucous membrane of the stomach.

There may be a sensation of weight or pressure in the epigastrium, and there is pyrosis, with regurgitation of bitter fluid at times. The patient is frequently the subject of severe and prolonged vertical headaches, and at times may have nausea and vomiting. Vertigo is common, the bowels are usually constipated and the urine is scanty and highly colored. The diagnosis is reached by a chemical test of the gastric juice, when it is found to contain .2% HCl.

Hypochlorhydria

Definition.—An abnormal condition of the stomach in which there is a deficiency of HCl in the gastric juice.

Adjustment.—This is caused by a vertebral subluxation at S. P., which impinges the secretory nerves leading to the secretory cells of the gastric glands and inhibiting the normal secretion of gastric juice. The nerve tracing is the same as in other affections of the stomach.

Symptoms.—The first indication of this form of neurosis is abdominal discomfort, which is soon followed by abdominal distension and belching of gas. The symptoms are present only when the stomach contains food. The gas is the result of fermentation, which occurs from the deficiency of HCl. The gaseous distension of the abdomen may be such that it interferes with respiration and with the action of the heart. There is the taste of a sour stomach, the tongue is coated and fissured, and there may be vomiting at times. When the stomach is entirely empty the symptoms are absent. Chemical analysis is the only positive proof of deficient HCl in the gastric juice.

Hypersecretion

Definition.—An abnormal condition of the stomach in which there is an overabundance in the secretion of normal gastric juice, and is caused by an S. P. subluxation.

Adjustment.—The specific adjustment for hypersecretion of gastric juice is at S. P., either the sixth, seventh or eighth dorsal vertebra, as will be determined by vertebral palpation. This is a condition of excess function of the secretory glands of the stomach, in which the quality of the secretion is normal, but in which the quantity is in excess.

Symptoms.—This begins gradually with a feeling of epigastric uneasiness and fullness. Later pain, with nausea, and vomiting occur. The vomit consists mostly of normal gastric juice of normal acidity. The mucous membrane of the esophagus and throat becomes red and raw from coming in contact with the strong acid secretion. This makes swallowing difficult. The vomiting occurs in paroxysms lasting from one to three hours each, and may be more or less continuous or periodical, in which case for long periods of weeks or months the symptoms may be absent or latent. The quantity of juice vomited per day may vary from one quart to one or two gallons. In some cases the attacks may have intermissions of several weeks or months, which are followed by many repeated attacks. In a few cases the attacks are continuous and vomiting occurs daily. The adjustment of the subluxation at S. P. relieves the pressure upon the nerves leading to the stomach and restores normal flow of secretory impulses to the gastric glands, which causes them to function in a normal manner, thus restoring the quantity of the secretion to normal.

Gastralgia

Definition.—An incoordination of the stomach in which there is a paroxysmal pain, not arising from any structural change in the organ.

Adjustment.—This is caused by an S. P. subluxation.

Symptoms.—This is more frequently a symptom than a specific incoordination, and when a symptom of some other disease is not considered as a neurosis. The onset is with nausea, a feeling of epigastric fullness, faintness, headache and vertigo. The pain is severe and agonizing, and occurs in

the middle of the epigastric region, radiating outward in all directions from this point. Tenderness is traceable from the abdominal region along the intercostal spaces to the spine. During the attack of the pain the face is pale and has an anxious expression, the hands and feet are cold, and the skin may be covered with cold perspiration. The entire attack may last from a few minutes to one or two hours. If the attack has a long duration the patient falls into a deep sleep from the extreme exhaustion. Many time the attacks may be suddenly brought on by drinking cold water or partaking of an over-hearty meal, but many such cases have become entirely free from the attack after a single Chiropractic adjustment.

Nervous Dyspepsia

Definition.—An incoordination of the stomach in which there are alterations in the quantity and quality of the gastric juice, accompanied by nervousness, and most frequently found in neurotic individuals.

Adjustment.—S. P.

Nerve Tracing.—This is the same as found in the other neuroses.

Symptoms.—The onset, course and duration of this is very variable. It frequently begins as any of the other neuroses, with epigastric oppression, distress, eructation of gas and bitter fluid, loss of appetite; yet many patients have an extremely capricious appetite, pyrosis and a coated tongue.

There may be severe paroxysms of gastralgia, which is often relieved by the partaking of food. There may be numbness of the extremities, coldness of the skin, flushes of the face and neck, occasionally hiccough and extreme hunger, and in most cases there is the formation and belching of gas. As nervous dyspepsia may include any or all of the other neuroses, their symptoms may predominate. Adjustments properly given at S. P. will soon restore normal function in the stomach, after which the indigestion disappears and the patient gains in flesh and strength.

Splanchnoptosis or Glenard's Disease

Definition.—A general term applying to the falling or prolapsis of any or all of the abdominal viscera. There are various forms, as follows:

Gastroptosis is a prolapsis of the stomach.—Adjustment, S. P.

Nephroptosis is a prolapsis of the kidney.—Adjustment, K. P.

Splenoptosis is a prolapsis of the spleen.—Adjustment, Spl. P.

Hepatoptosis is a prolapsis of the liver.—Adjustment, Li. P.

Enteroptosis is a prolapsis of the intestine.—Adjustment, upper lumbar.

Pathology.—The local subluxation produces pressure upon the motor nerves leading to the structures holding the viscera in situ; and because of the loss of motor function, due to this pressure, the ligaments become relaxed and atonic, the weight of the organ is then sufficient to permit it to drop, and stretches the relaxed ligaments.

Nerve Tracing.—The tenderness is from the local zone of the subluxation to the region over the organ prolapsed.

Symptoms.—If but one organ is displaced and the displacement is slight, the symptoms may be latent or absent, but since prolapsis of an organ is often associated with enlargement of the organ, pressure symptoms are present in the majority of cases. There is a feeling of weight, pressure or bearing down in the abdomen and constipation, due to the pressure upon the intestine. The abdomen may be distended, due to the enlargement of the displacement. The digestion may be poor and the patient may be weak, but, as a rule, does not lose much flesh. The prolapsed organ may be palpable and its outline can be determined by percussion.

The adjustment will release the pressure upon the nerve and permit the normal flow of motor impulses to the structures holding the viscera in place, whereby these structures will

again regain their normal tonicity, hence will contract and slowly draw the displaced organ into the normal position.

Acute Catarrhal Enteritis

Definition.—An acute catarrhal inflammation of the mucous membrane lining the intestines, characterized by fever, pain, tenderness and looseness of the bowels.

Adjustment.—C. P., K. P. and upper lumbar.

Pathology.—The mucous membrane lining the small intestine is the location of inflammation or excessive heat, in which there is redness from the hyperemic vessels and swelling from an effusion of serum into the surrounding tissues. The mucous follicles are inflamed and give off an abnormal exudate of transformed mucus, serum and fibrin. In the more severe cases the membrane may become destroyed and small areas of ulceration will result.

Nerve Tracing.—Tenderness is traceable from the upper lumbar region and follows a course over the crest of the ileum to the region over the inflamed intestines.

Symptoms.—This is the most common condition in which there is diarrhoea of a mucous stool. The onset is with a moderate diarrhoea, abdominal pain, loss of appetite, and a slight fever of 101 to 103 degrees. The skin is hot and dry, the face flushed, the pulse is strong and rapid, the respirations are increased in frequency, and there is marked weakness for the slight degree of fever that is present. The intestinal inflammation may be limited to the mucous membranes of the duodenum or the stomach and duodenum, in which case it is called duodenitis or gastro-duodenitis, and is marked by localized tenderness in the upper and right side of the abdomen. In duodenitis there is costiveness in place of diarrhoea, often resulting in impaction of fecal matter in the intestines. The ileum and jejunum are most frequently affected, in which case the tenderness is diffuse over the center of the abdomen, and there is severe diarrhoea of a mucous and lenteric stool. Occasionally blood and bile will be passed in the stool, but when

the inflammation is localized in the colon the stool is watery or soup-like, and contains larger quantities of mucus than in any other intestinal inflammation. Proctitis is an inflammation of the mucous membrane of the rectum, and is marked by the passage of considerable quantities of mucus and pus, and by persistent tenesmus.

Acute enteritis can be distinguished from dysentery by the less severe symptoms of prostration, absence of tenesmus and griping, less frequency in the evacuation of the bowels, and absence of the bloody mucus stool.

Chronic Catarrhal Enteritis

Definition.—A prolongation or continuation of the acute form, characterized by chronic diarrhœa.

Adjustment.—K. P. and upper lumbar.

Pathology.—The local lumbar subluxation causes pressure upon the calorific nerves leading to the mucous membrane lining the small intestine, and also colon in some cases. This brings about an inflammation or excessive heat, with hyperemia, swelling, redness, and exudation of a transformed mucus and serum into the lumen of the intestinal tract. The adjustment of the local lumbar subluxation removes the pressure from the calorific nerves leading to the mucous membrane of the intestines, thus restoring normal heat to the part.

Nerve Tracing.—In the chronic form the course and distribution of tenderness is the same as that found in the acute form; however, tenderness is not so marked in the former.

Symptoms.—Preceding the arrival of the incoordination to the chronic stage, it usually passes through the acute, from which it merges into the chronic. Thus the symptoms of acute enteritis will have preceded the chronic form. Very often the colon alone is affected, in which case there is a local tenderness along the course of the colon, and a mucus stool containing undigested food.

Because of this improper digestion in the inflamed intestine the body suffers from improper nutrition, hence becomes

emaciated and anemic. When the patient sees his emaciated and debilitated condition he often becomes melancholic and loses interest in life, or may become the subject of mental depression. The effect of the adjustment in chronic enteritis will be the same as in the acute form. As soon as the pressure is removed from the calorific nerves and the impulses are permitted to be normally expressed, the inflammation subsides and the mucous membrane regains its normal condition and resumes its normal function.

Acute Dyspeptic Diarrhoea

Definition.—A condition of the small intestine in which there are defects in the various intestinal secretions or deficient peristalsis, or both, resulting in the decomposition of the chyle, and characterized by extreme looseness of the bowels.

Adjustment.—C. P. and K. P. for the fever, and second lumbar for the local incoordination of the small intestines.

Pathology.—There is a slight inflammation of the mucous membrane of the small intestine, with the characteristic conditions common in inflammation of mucous membranes. The inflammation is not catarrhal, and is not accompanied by the passage of large quantities of mucus. There are alterations in the secretion of the intestinal juices and loss of motive power in the intestinal muscles.

Symptoms.—This is an incoordination of children, and is most commonly found in bottle-fed children. The onset is with restlessness, irritability, a slight fever, or in the most severe cases a high fever of 104 degrees, a diarrhoea of an offensive, fluid stool which contains undigested milk, food and a very little mucus. In the severe cases where the temperature rises to 104 degrees the onset may be with a convulsion, which is followed by the above named symptoms. The case readily yields to adjustments. Many cases as young as one to three weeks have been adjusted with excellent results.

Cholera Infantum

Definition.—An acute inflammation of the mucous membrane of the stomach and intestines, characterized by severe colicky pain, vomiting, purging and prostration.

Adjustment.—S. P. for the inflammation of the stomach, second lumbar for the inflammation of the small intestines, and K. P. for the elimination of poisons from the body and for the dissipation of heat, which is present as fever. The S. P. adjustment may also serve as C. P., as they are in adjacent zones.

Pathology.—The mucous membrane of the stomach and small intestines become inflamed and swollen from the effusion of serum into the submucous tissue. From the surface of the mucous membrane there is an effusion of serum occurring into the fundus of the stomach and into the lumen of the intestine. As the duration of this incoordination is very short, the pathology does not pass through many stages.

Nerve Tracing.—The tenderness is traceable from the 14th and 21st intervertebral foramen on either or both sides, and extends outward around the trunk, becoming diffuse over the region of the stomach and small intestines.

Symptoms.—The onset is sudden, with a sensation of chilliness, which is followed by a rapid rise in the bodily temperature to 103 or 105 degrees. The sudden rise in the temperature is accompanied by severe vomiting, abdominal pain, and severe purging. At first the contents of the stomach are vomited, and the stool consists of the contents of the intestines, but within a few hours after the stomach and intestines have been emptied, the vomitus and stool take on a different character, and resemble each other. Both the stool and vomitus become serous in character. The stools vary from 10 to 30 in 24 hours, and the vomiting is most persistent. There is an extreme thirst, large quantities of cold water being drunk, but soon vomited. The stools are at first fecal and have an offensive odor, later becoming yellowish and green and having a fetid odor, indicating putrefaction.

In case the temperature should increase to 106 or 108 degrees death will soon occur, or if a high temperature like this should be present at the onset, death may occur within 24 hours. Recovery usually begins between the third and fifth days, or then the symptoms of collapse may appear, indicating impending death. Though the incoordination may have lasted but a few days, there has been great emaciation, the eyes are sunken and partially closed, the mouth open, and the lips are cracked and bleeding, the skin is cold and clammy, the pupils are contracted, and the child finally passes into a stupor, in which the pulse becomes imperceptible, respiration is faint, and life passes from the body.

The immediate adjustment of S. P., K. P. and second lumbar will restore the normal transmission of mental impulses from the brain to the mucous membrane of the stomach and intestines, permitting the membrane to function in a normal manner, which, when accomplished, will prevent the appearance of any symptoms.

Acute Enterocolitis

Definition.—A catarrhal inflammation of the lower part of the small intestine and of the upper part of the large intestine, in which there may be a moderate degree of suppuration.

Adjustment.—K. P. and second lumbar.

Pathology.—This is also called ulcerative enterocolitis, and when in the beginning stage is marked by inflammation or excessive heat, a hyperemia of the blood vessels in the lining membrane, edema and swelling of the submucosa and adjacent tissues, and an exudation which is catarrhal in character, from the mucous membrane. Later there will appear at certain points along the course of the intestinal mucosa small ulcers from one to two lines in diameter and of circular shape, which creep along or undermine the mucous membrane, and may finally coalesce, forming a larger ulcer.

The secreting glands become enlarged and soft because of the edematous swelling, but rarely, if ever, undergo ulceration.

Symptoms.—This begins with a moderate diarrhœa, the stool at first containing the contents of the intestines, and later contain mucus, which is streaked with blood. There is a loss of appetite, excessive thirst, nausea and vomiting, abdominal pain and tenderness, and an irregular fever of 102 to 104 degrees. The stools are small in quantity and semi-fluid of a greenish color, and contain both blood and undigested food. The number of stools may vary from 10 to 40 in 24 hours. The individual becomes emaciated and weak, the skin is pale or yellowish, the facial expression is dull and uncheerful, the mouth is dry, the breath is fetid, and the tongue is constantly coated.

An adjustment of the second lumbar vertebra will release the pressure upon the nerves leading to the mucous membrane of the intestine and restore normal heat, which will permit normal function and prevent any further symptoms from appearing, and effect normal digestion.

Diphtheric Enteritis

Definition.—An excessive heat of the mucous membrane of the small intestine, characterized by the formation and discharge at stool of a pseudo-membrane.

Adjustment.—Second lumbar and K. P.

Pathology.—The mucous membrane becomes swollen and hyperemic, and its follicles give off an exudate which is rich in fibrin. This fibrin forms a network which acts as the framework of the false membrane, and in the meshes of this framework is deposited the mucus, destroyed epithelium, serum and albumin. Shreds of the fibrin extend down into the follicles of the mucous membrane, and are only detached from the true membrane by a process of suppuration, after which the false membrane sloughs off and is discharged with the stool.

Symptoms.—The onset is rather sudden, with slight feverishness and distention of the abdomen. This distention is gaseous and results from the decomposition of the feces. The

abdomen is tender and there is paroxysmal pain. This pain is produced by the passage of the stool through the intestine and tearing the false membrane loose from the mucous membrane. This tearing causes bleeding, so that the stool not only contains shreds of pseudo-membrane but also blood and mucus. After the discharge of a quantity of this false membrane the pain is lessened or absent for a time, or until some more membrane forms. The abdominal tenderness and soreness still remain, and may be attended by emaciation, weakness and gastro-intestinal symptoms.

The nerve tracing may be very marked in this incoordination. The tenderness follows a course from the 21st intervertebral foramen on either side over the crest of the ileum to the region over that part of the intestine affected.

Dilatation of the Colon

Definition.—A condition wherein there is a relaxation of the muscular fibres which form the wall of the colon, thus permitting it to stretch or dilate.

Adjustment.—Local in the middle lumbar region, as will be determined upon vertebral palpation.

Pathology.—The subluxation causes an impingement upon the nerve conveying the motor impulses to the muscular fibres of the muscular coat of the colon, thus causing them to lose their normal muscular tonicity and become relaxed. The degree of relaxation may be so great that the normal peristaltic motion is lost, and, as a result, the fecal matter accumulates in the colon.

Symptoms.—On account of the relaxed condition of the colon walls the fecal matter cannot be properly forced along in the intestine, hence accumulates in the colon, producing an obstinate constipation. The intestines become impacted with fecal matter, the abdomen is distended, the skin is sallow, and there is meteorism.

Constipation is a form of dilatation of the colon wherein there is a loss of the muscular tone of the intestinal walls,

which lessens the peristaltic motion and prevents free movement of the bowels. This should not be confused with costiveness, which is a dryness and hardness of the stool, due to improper secretions.

Constipation may be characterized by either an insufficient frequency in the evacuation of the bowels or by an insufficient quantity at each evacuation. A patient suffering with constipation will have dull headaches, drowsiness, a feeling of constant fullness, sallowness of the skin, and straining at stool.

The adjustment of middle or lower lumbar subluxations will restore normal motor impulses to the muscle fibres of the intestinal walls, which will permit normal peristaltic motion and normal evacuation.

Diarrhoea

Definition.—An abnormal frequency of a fluid evacuation of the bowels without tenesmus, and resulting from over-secretion of the digestive fluids.

Adjustment.—The adjustment for diarrhoea is very variable, depending upon the organ that takes part in the over-secretion. If the liver secretes an overabundance of bile the adjustment is at fourth dorsal; if the gastric secretion is overabundant adjust S. P., or the adjustment may be at K. P. or upper lumbar. The bowels being an excretory organ will assist in elimination adaptatively when the kidneys are abnormal, and in the attempt to accomplish this there is diarrhoea, when K. P. should be adjusted. The lumbar adjustments would be given when there is oversecretion from the intestinal mucous membrane.

Symptoms.—Diarrhoea may be acute or chronic, and is manifested chiefly by an alteration in the number and character of the stools. There is frequent evacuation of the bowels, colicky abdominal pain, anorexia and emaciation. Examination of the stool will often assist in locating the organ

that is working abnormally. The list below covers the common cases.

1. **Mucous stools** are those in which there is a large quantity of mucus passed, and indicate an abnormal condition in the mucous membrane of the intestine. Found in enteritis.

2. **Lienteric stools** are those in which there is contained undigested food, and indicate intestinal indigestion. Found in enteritis and dyspeptic diarrhœa.

3. **Watery or serous stools** contain much serum, and indicate intestinal inflammation, as found in cholera infantum.

4. **Green stools** are those containing bile, and indicate an abnormal condition in the liver or bile ducts, as found in obstruction of the common bile duct by gall stone in the ampulla of Vater, such stone having a ball valve action.

5. **Fatty stools** are those containing undigested fat, and indicate an abnormal condition of the pancreas, as found in acute pancreatitis.

6. **Purulent stools** are those containing pus, and indicate a suppurative process in the intestine or the rupture of an abscess into the intestine, as is found in typhoid fever.

7. **Bloody stools** are those containing blood, and result from hemorrhage of the capillaries of the mucous membrane, as is found in cancer of the intestine or in dysentery.

Enteralgia

Definition.—An acute paroxysmal pain of the intestines, resulting from a violent muscular contraction of the intestinal walls.

Adjustment.—Local in the lumbar region, as determined upon palpation of that region.

Symptoms.—This is an intestinal neurosis and has no pathological condition. The attacks are usually infrequent and may be brought on by a large drink of cold water, a large meal, or by excessive exercise. The onset is sudden, with

severe pain situated near the umbilicus and radiating in all directions from this point. The abdominal muscles are tensed and respiration is hindered by the muscular contraction, the skin is cool and clammy, the face has an anxious expression and the features are pinched.

There may be nausea and vomiting with the attack. The attack may be intermittent in itself or may be continuous, lasting from a few minutes to two or more hours.

If firm pressure with the palm of the hand be placed upon the abdomen in the region of the umbilicus the pain will be greatly relieved and may be temporarily stopped. An adjustment will give immediate and permanent relief. Many cases of this nature have been handled with the greatest of success.

Mucous Colic

Definition.—A secretory neurosis of the intestines, in which there is the discharge of large quantities of mucus, accompanied by a severe colicky pain.

Adjustment.—Atlas, K. P. and local in the lumbar region. The local lumbar subluxation is the cause for the intestinal incoordination, but the atlas is also adjusted, as the condition always occurs in neurotic individuals and is accompanied by many nervous symptoms that would indicate an atlas subluxation. The K. P. adjustment, as in all cases, is for the elimination of excretory material.

Pathology.—This being a neurosis, there is no marked structural change; however, the mucous follicles of the intestines are hyperactive and secrete an abnormal and transformed mucus, which forms a pseudo-membrane and offers a partial obstruction to the descent of fecal matter. This hypersecretion is not attended by any inflammation, but there may be a neurotic hyperemia of the vessels in the lining membrane.

Symptoms.—Mucous colic is nearly always subacute or chronic in its course, but at the same time always has an

acute onset. There is gastric and intestinal discomfort, with slight indigestion for a short time preceding the onset, which is with severe pain, occurring in paroxysms, and relieved upon the discharge of a quantity of this abnormal mucus. The pain begins lightly and is located in the lower part of the abdomen, after which it increases in severity until the pain resembles that of renal colic, and after the passage of the membrane in the stool gradually declines until more membrane is formed. The paroxysms may occur daily, but the majority of cases occur irregularly. There is very marked tenderness, which is located in each or either of the iliac fossa. There is vesical and rectal tenesmus, and the stools are often ribbon shaped or may be cylindrical, with large casts of the intestine. The membrane can be unravelled by placing it in water and picking it apart with needles. The bodily temperature is normal, the nutrition is impaired, the patient becomes emaciated and weak, the rectum remains sore and irritable, and finally many peculiar nervous symptoms arise that can only be explained by the existence of an atlas subluxation.

Among the nervous symptoms are those of neurasthenia and hysteria, with convulsions, stupor, coma and sometimes a pseudo-paralysis.

Ulceration of the Intestine

Definition.—A circumscribed area of suppuration upon a free surface, in which there is destruction of tissue.

Adjustment.—K. P. with local in the lumbar region. If on the duodenum lower S. P. should be adjusted.

Pathology.—The local area becomes red, hyperemic and swollen at the beginning, after which the epithelial cells become broken down and undergo decomposition. This process continues until a small circumscribed area has decayed, forming an ulcer. The ulcer may be tubercular, cancerous, syphilitic, or may occur in typhoid fever, dysentery or simple enteritis. The exact pathology will vary according to the disease with which it is present.

Nerve Tracing.—Tenderness is traceable from the local subluxation in the spine to the area immediately over the ulcer.

Symptoms.—The symptoms are variable, depending upon the condition with which they are associated, and are indistinctive in many cases. There is usually pain and tenderness, which is greatly increased by palpation and upon coming in contact with the intestinal contents. Pus is discharged with the stool, and if the ulcer deepens into the intestinal wall small vessels will be perforated, which will give rise to hemorrhages and the passage of blood in the stool. The colon is most frequently affected and the ulcers may be simple or multiple.

Appendicitis

Definition.—An inflammation or excessive heat of the vermiform appendix, involving the surrounding peritoneum, characterized by fever, pain and localized tenderness at McBurney's point.

Inflammation of the appendix may be simple, ulcerative or interstitial.

Etiology.—Appendicitis is caused by a vertebral subluxation in the region of the second lumbar vertebra, which causes pressure upon the calorific nerves leading to the vermiform appendix and produces an excessive heat in the tissues of that organ.

Pathology.—The simple form begins with swelling and hyperemia of the mucous membrane lining the appendix. The swelling results from the infiltration of serum into the surrounding cellular tissues. The serous surface becomes dry and congested, and the friction produced by the two inflamed layers coming in contact with each other gives rise to most severe pain. The lumen of the appendix finally becomes occluded and the organ is transformed into a cyst.

The ulcerative type begins in a similar manner, but small ulcers form upon the mucous membrane lining the organ, which soon reach the submucous and muscular tissue, and

may finally perforate the wall of the appendix. The tissue of the organ may undergo suppuration and an abscess will form. The pus may either perforate into the abdominal cavity or into the intestine, or it may be absorbed and eliminated through the kidneys.

The interstitial or parietal form may have all the changes noted above, and in addition undergo a severe form of necrosis, or possibly gangrene, with perforation. The entire organ is enlarged and may be palpable where the pain is not too great. Many cases that perforate into the abdomen do recover by rapid absorption and elimination.

Nerve Tracing.—Marked tenderness is traceable from the 21st intervertebral foramen on the right side, following a course outward over the crest of the ileum to McBurney's point, which is located about the middle of a line drawn from the umbilicus to the center of Poupart's ligament. Moderate tenderness may be found over the entire abdomen, but the severe tenderness is localized over the region of the appendix.

Symptoms.—The onset of appendicitis is variable, but the majority of cases begin with a feeling of abdominal discomfort and dull aching pain in the right side. This pain increases in severity and area until respiration, coughing, or marked movement increases it beyond the endurance of the patient. In order to lessen the pain the patient lies upon the back in the recumbent posture with the right thigh flexed upon the abdomen and the right rectus muscle in a rigid state. This prevents movement of the inflamed parts and therefore lessens the pain. Fever may be present from the start and may begin with or without a slight chill. The temperature will vary from 101 to 104 degrees. In the great majority of cases the bowels are costive and the fecal matter is impacted in the intestines, but in a few cases there is diarrhoea. The urine is scanty and highly colored and contains indican. The appetite is lost, the tongue is coated, vomiting may occur, and in the male the right testicle is drawn up.

Upon palpation there is marked tenderness on the right

side over the region of the appendix, and after the second day a small tumor about the size of a hen's egg is palpable; this is the enlarged appendix. The respiration is hurried and of the superior costal type, and the pulse is rapid and bounding. When the peritoneum is involved to any great extent the facial expression is anxious, the upper lip is drawn upward so that the upper teeth are uncovered, and is known as the Hippocratic countenance. If the case is simple it usually terminates with resolution, in which the inflammation subsides, the pain and tenderness lessens, the general fever subsides, the flexion of the thigh and rigidity of the right rectus muscle depart and the patient recovers in a week or ten days. If a patient in this condition is given an adjustment, recovery will be effected in two to five days. As soon as the adjustment is made and the normal flow of impulses restored to the appendix, the inflammation subsides and rapid recovery takes place.

If abscess formation or gangrene occurs it is marked by a sudden change in the course of the fever. During the simple stage the fever is regular and of moderate severity, but as soon as suppuration takes place it becomes irregular and high. There are recurrent chills, fever and sweats; this is known as the suppurative type of fever. The adjustment will have the same effect upon this form as in the preceding variety, but a longer period of time may be required to effect a complete recovery.

Differential Symptoms.—It is necessary to distinguish between appendicitis, renal colic and hepatic colic. Right renal colic differs from appendicitis in that the pain starts in the back in the right lumbar region and radiates obliquely downward toward the bladder, the pain is sharp and darting, urination may be stopped during the passage of the calculus, the right testicle is drawn up, blood is passed with the urine, and there is no unilateral contraction of the abdominal or thigh muscles.

Hepatic colic has a sudden onset, without or with slight

fever; the pain radiates into the right shoulder along the course of the 11th spinal nerve to the spine. There is jaundice, and tenderness is localized in the right hypochondriac region, the stools are clay colored, the urine contains bile pigment, and palpation and nerve tracing reveal the Li. P. sublaxation and tenderness to the region over the liver. In both right renal colic and hepatic colic there is less fever and constitutional symptoms, no localized tenderness, and tumor in the region of McBurney's point, no indican in the urine, no tracing from the 21st zone on the right side, no second lumbar sublaxation and no unilateral contraction of the abdominal and thigh muscles.

Chronic or recurrent appendicitis may have the same pathological condition as the simple form, except that it is in milder form.

During the intervals the patient may experience no symptoms other than that the bowels are constipated, and upon deep and firm pressure tenderness is present in the appendical region.

The attacks are the same as the acute form, but in a milder degree, the fever may be absent, the pain and tenderness are marked, and the constitutional symptoms are present as in the acute form.

Intestinal Obstruction

Definition.—A condition in which the lumen of the intestine is partially or completely closed to the descent of fecal matter.

Adjustment.—The adjustment must be made locally, according to the location of the obstruction and according to the findings upon vertebral palpation. The sublaxation will usually be found in the upper lumbar region.

Pathology.—A great variety of conditions are capable of producing obstructions of the intestines. Among the more common conditions are **strangulation**, in which there is a contraction of the circular muscles of the intestinal wall; **intussusception** or a telescoping of the intestines in which one part

of the intestine passes into another part, as the ileum into the colon; *volvulus* or a condition in which there is a twisting or knotting of the intestine, or there may be a condition of fecal impaction, obstruction by impacted gall stones, obstruction due to pressure by some prolapsed organ or by some tumor that may be growing in the abdomen.

Symptoms.—Acute intestinal obstruction always begins with a severe pain in the abdomen located in the region of the obstruction. At first this pain may be colicky and intermittent, but as soon as the obstruction becomes more decided the pain is severe and continuous. There is excessive tenderness over the region of the obstruction, and this tenderness is traceable to the spine at the point where the pressure is produced. As soon as the obstruction is complete, vomiting becomes very persistent. At first the contents of the stomach is vomited, after which there is continued retching. This continued retching soon produces a backward peristalsis of the stomach, and bile enters through the pyloric valve. The regurgitating bile is then vomited and may have a fecal odor. Later fecal matter is vomited. The abdomen is distended by tympanites and no fecal matter passes through the rectum. If the obstruction is in the colon this tympanites is very marked, and is but slight when the obstruction is high in the small intestine. If the condition producing the obstruction is intussusception a small sausage shaped tumor may be palpable.

In general, there is great prostration, pallor, anxious expression on the face, rapid and shallow respirations, rapid and feeble pulse, cold sweats, and finally severe collapse and death in from three to six days.

In case the obstruction is partial or chronic the symptoms are much more mild. It is noticeable that there is infrequency of defecation, the stools are small in diameter, and if the obstruction is low in the colon, the stool is ribbon shaped, the abdomen is distended, and there is a feeling of abdominal discomfort, the skin becomes pale and sallow, occipital headaches

are frequent, the appetite is poor, the body becomes emaciated, and there is so much absorption of poison from the impacted bowels that general anemia develops from the autointoxication.

Carcinoma of the Intestine

Definition.—A malignant epithelial growth undergoing progressive degeneration and destroying the intestinal wall.

Adjustment.—K. P. and local in the lumbar region, depending upon the part of the intestine affected.

Pathology.—This begins with an accumulation of cells beginning in the secretory glands of the intestine. These cells are of the epithelial variety and are situated upon a fibrous stroma. During the early stages there is no form of decay present and the growth has no other effect than might be produced by its pressure upon other organs. The great majority of cancers of the intestine are found in the lower part of the large intestine.

Later a process of degeneration begins in the cells which were first formed. This form of degeneration is commonly known as colloid, and progresses at a very rapid rate, destroying the intestinal wall and obstructing its lumen. A portion of the poison is being constantly absorbed and prevents the normal nutrition of the body at large, giving rise to the cancerous cachexia.

Symptoms.—So long as the growth is small and there is no suppuration in it the symptoms may be latent or absent, but as soon as it becomes large pressure symptoms are produced. Among the early pressure symptoms are constipation from pressure upon the intestine itself, edema of the lower extremities from pressure upon the veins draining that part, feeble pulse in the femoral artery from pressure upon that artery, and possibly irritability of the bladder from interference with its function.

As soon as suppuration begins there is an intermittent dull, gnawing, burning pain in the pelvic region, with a sensa-

tion of weight and bearing down. Upon palpation of the abdominal viscera the tumor may be felt. Anemia and cancerous cachexia develop from the interference with nutrition, resulting from the presence of toxins in the blood and serum of the body. Pus is passed with the stool, and at times it may also contain blood which has been effused from the perforation of blood vessels by the ulceration. The patient becomes greatly emaciated and debilitated, the skin is of a dark, yellowish color, the appetite is poor, the abdomen is distended, and if the growth is of sufficient size to produce obstruction there will be vomiting of a fecal character, with signs of collapse and sudden death.

DISEASES OF THE LIVER

Prolapsis of the Liver

Definition.—A condition in which the structures holding the liver in position become relaxed and permit the organ to drop.

Adjustment.—This is caused by a subluxation at Li. P. which produces pressure upon the motor nerves leading to the ligaments which hold the liver in position, causing them to relax and permitting the weight of the organ to carry it downward. These ligaments have lost their tonicity and have stretched. By an adjustment of the causative subluxation the motor impulses will be permitted to flow unhindered to these ligaments and will give to them their normal tonicity, whereby they will again contract and gradually draw the liver into its former normal position.

Nerve Tracing.—The tenderness is traceable from the 11th intervertebral foramen outward over the scapular region and beneath the axilla to the right hypochondriac region.

Symptoms.—Many cases exist without giving rise to any symptoms, but most cases have a few subjective symptoms as well as physical signs. There is a sensation of pressure, weight and bearing down in the right side, and a feeling of

fullness and discomfort after eating. This sensation of discomfort may amount to pain in some cases, the pain radiating along the course of the nerves to the region of the right shoulder and the fourth dorsal vertebra.

Upon percussion the area of hepatic dullness is increased downward to the right, and upon palpation the organ can be felt. The lower portion of the right lobe may be as low as the horizontal umbilical line. Upon inspection the right side may be seen to bulge more than the left. This condition is more commonly met with in lean individuals, and especially women who have borne many children and whose abdominal walls are relaxed and pendulous. The adjustment will restore normal motor activity in the atonic ligament, which will correct the abnormality.

Acute Catarrh of the Bile Duct

Definition.—This is the condition most commonly spoken of as simple jaundice or icterus, and is an acute catarrhal inflammation or excessive heat in the mucous membrane lining the bile ducts, and is characterized by gastrointestinal disturbances and a yellowish discoloration of the skin.

Adjustment.—The adjustment is at Li. P. and K. P. The local Li. P. subluxation causes the inflammation of the membrane lining the duct, which partially obstructs it and results in the backing up of the bile. The K. P. adjustment is for the purpose of increasing the elimination of waste products, which will include the bile pigment that is scattered in the fluids of the body. If associated with gastroduodenitis, adjust lower S. P.

Pathology.—The excessive heat produces a swelling of the mucous membrane and an hyperemia of the blood vessels. The swelling results from an infiltration and accumulation of serum in the mucous and submucous tissue of the bile ducts. The duodenum may be similarly affected, and the inflammation of the bile ducts may be an extension of the gastroduodenitis. The swelling lessens the size of the lumen of the

duct and prevents the normal flow of bile into the duodenum, thus it is retained in the liver and absorbed from that organ by the fluids of the body and carried to all parts.

Nerve Tracing.—Tenderness is traceable from the 11th intervertebral foramen on the right side and follows a course over the scapular region, beneath the axilla to the right hypochondriac region.

Symptoms.—In a few cases there are no symptoms other than a moderate or slight jaundice, but most cases begin with epigastric distress, anorexia, nausea and vomiting, a coated tongue, fetid breath, and a slight fever of 101 or 102 degrees. After a few days' duration the jaundice becomes noticeable, at first as a slight subicteric tint in the conjunctiva, and later is apparent over the cutaneous surface of the entire body. The urine is very dark in color, because of the presence of bile pigment which the kidneys have extracted from the fluids of the body. The stools are of a light or clay color, because of the absence of bile, and may have undergone putrefaction while in the colon, therefore usually have a fetid odor. There may be a flushing of the bowels, or at times there may be constipation. There is a dull, temporal headache which is accompanied by mental dullness and general irritability. The skin may be excessively itchy. The liver may be swollen and tender, but this rarely occurs in an acute attack of simple jaundice. The adjustment at Li. P. will restore the normal flow of impulses to the bile ducts and reduce the excessive heat to normal. This will cause the swelling to subside and permit the lumen of the duct to resume its normal size, which will permit the free flow of bile into the intestine, where it belongs, and the subsidence of all symptoms indicating obstruction of the duct. The K. P. adjustment will permit a greater flow of impulses to the kidneys, thus giving to them more power with which to carry on their work of elimination, thus enabling them to rid the body of the bile pigment which is scattered throughout its fluids and secretions.

Chronic Catarrh of the Bile Duct

Definition.—This is a continuation of the acute form in which the bile ducts become greatly obstructed, and is usually associated with a stone lodged in the ampulla of Vater.

Adjustment.—Li. P. and K. P. Sometimes the eighth dorsal is adjusted for the lower part of the common bile duct, as it is adjacent to and in the same zone as the upper part of the duodenum.

Pathology.—Chronic catarrh rarely occurs unless there is some additional obstruction in the common bile duct which is capable of keeping up a continual irritation. This is most frequently done by a gall stone which has become lodged in the ampulla of Vater and which has a ball valve action; that is, it is capable of slight movement with the change of position, so that at times the obstruction is complete and at times only partial.

In addition to the obstruction offered by the lodged stone there is a chronic catarrh, which produces a swelling and hyperemia of the mucous membrane lining the common duct, so that the bile is not permitted freedom to flow through its normal channel, but is dammed back by this obstruction and absorbed by the blood, serum and lymph, being carried to all parts of the body, and the pigment becomes deposited in the skin and elsewhere, giving rise to the condition known as jaundice.

Symptoms.—The nerve tracing and area of tenderness is the same as in the acute form. If the obstruction is complete there is an intense jaundice without fever, which is preceded by a history of previous attacks of hepatic colic. Death would soon occur if the obstruction were complete, as the secretion of an organ is a poison to that organ when it is retained in the organ for a great length of time after being secreted. The great majority of cases of chronic catarrh of the common bile duct have a long course, indicating that the obstruction is only partial. There is a history of past

attacks of hepatic colic, and even during the course of the chronic jaundice there may be attacks of severe pain in that region, indicating the movement or passage of a calculus. This painful attack is accompanied by an irregular fever, with chills and sweats. The sweat and other secretions are tinted by the presence of bile pigment. The conjunctiva is deeply icteric, the stools are pale and clay colored, but may contain large quantities of bile at times when the stone has so changed its position that it permits the flow of bile; the liver and gall bladder may be enlarged at times and may be slightly tender.

The patient becomes emaciated and weak, the skin is intensely itchy, the digestion is poor and the temper is irritable. Should the impacted stone pass through the opening into the duodenum, the pain and jaundice will immediately cease, and recovery will occur within a short time. This is frequently done.

The adjustment will restore normal motor tonicity and normal calorific impulses to the common duct, whereby the inflammation will subside, thus reducing all swelling due to the inflammatory process and permitting the stone to pass with greatest ease.

Suppurative Inflammation of the Bile Duct

Definition.—An inflammation of the common and smaller bile ducts in which there is suppuration or a process of decay.

Adjustment.—Li. P. and K. P., possibly in combination with eighth dorsal vertebra.

Pathology.—This is the same as in the preceding form of jaundice, except that the inflammation is suppurative in character, and the pus formed through the suppurative process collects, forming multiple or single abscesses.

Symptoms and Nerve Tracing.—The tenderness is traceable from Li. P. over the scapula and beneath the axilla to the region of the liver, and the degree of tenderness in the region of the liver is very great.

The symptoms of jaundice are the same as described in the preceding disease, but in addition there is continuously present a remittent fever, which is typical in suppuration. The urine will contain indican, the liver is swollen and tender, there is great loss of flesh and strength, there is a throbbing pain in the region of the liver, which is increased upon deep breathing, and if the pus forms into an abscess it may be palpable and may perforate into the intestine, stomach or peritoneum.

Icterus Neonatorum

Definition.—A jaundiced condition of the new-born.

Adjustment.—Li. P. and K. P.

Pathology.—There are two forms, the physiological and the pathological. In the former there is a simple inflammation or excessive heat in the mucous membrane lining the common bile duct, which causes it to swell and partially or completely close its lumen, so that the bile is unable to pass into the duodenum.

The pathological form is severe and usually fatal to life, but it is extremely rare. In this form there is complete obstruction, obliteration or absence of the common bile duct, so that it is impossible to have any outlet for the passage of the bile from the liver.

Symptoms.—The mild or physiological form is common, and is marked by the symptoms of simple icterus. The conjunctiva is slightly discolored, as is the skin; the fecal matter is light or clay colored and of a fetid odor, and the urine may contain a trace of bile. This form usually disappears in from four to fourteen days.

The pathological form is marked by a severe jaundice, which increases in intensity; by bile-stained urine, clay-colored stools, great weakness and poor nutrition. This is commonly found in cases of congenital syphilis, and is a fatal condition.

Stenosis and Obstruction of the Common Bile Duct

Definition.—A closing or occlusion of the common duct, either from pressure from without, growth within, or by the lodgment of any foreign substance in the duct itself.

Adjustment.—K. P. and local. This local will most frequently be Li. P., but may vary according to the condition causing the pressure or obstructing the common duct.

Pathology.—Very commonly the obstruction is due to a gall stone that has become lodged in the ampulla of Vater, but aside from this, the common duct may be pressed upon by a growth or tumor of the head of the pancreas, or by a tumor of the pylorus or other structure in that region. The obstruction could be produced from laceration and adhesions from the previous passage of a calculus.

Symptoms.—The symptoms are similar to other forms of chronic jaundice. The icterus is first seen in the conjunctiva and later in the skin; the stool is of a light color, while the urine is heavily colored with bile pigment; the liver is slightly enlarged and tender, the gall bladder is enlarged and prolapsed; there is dull pain in the right hypochondriac region, which radiates upward into the right shoulder, and there may be slight and irregular fever, with gastric and intestinal disturbances. Palpation and nerve tracing will greatly assist in determining whether the obstruction is due to pressure from a tumor on the head of the pancreas, tumor of the pylorus, or any other form of obstruction that may be suspected.

Carcinoma of the Gall Bladder

Definition.—A pernicious and malignant growth of epithelial tissue, progressively destroying the wall of the gall bladder and filling its cavity.

Adjustment.—Li. P. and K. P.

Pathology.—The tumor consists of epithelial cells, which are situated upon a fibrous stroma or base, and in which there is progressive colloid degeneration, ulceration and decay.

Nerve Tracing.—Marked tenderness will be traceable from the region of the 11th intervertebral foramen, over the scapular region and beneath the axilla to the region over the gall bladder, which is at a point where a line drawn from the acromian process of the scapula to the umbilicus bisects the ninth costal cartilage, or it is about one and one-half inches below the ensiform cartilage and about one and one-half inches to the right of the median line.

Symptoms.—The onset is gradual, with a feeling of discomfort and weight in the right side. Later this sensation amounts to a dull aching pain which is subject to paroxysms, during which it is severe. The skin and conjunctiva indicate a chronic jaundice, and the emaciation and debility indicate great nutritional impairment. The gall bladder is enlarged and tender, and upon palpation the tumor may be felt. The cancerous cachexia soon develops, with great emaciation and weakness, indicating cancer. There may be melena in the stool, and occasionally there is ascites. General and irregular fever becomes apparent towards the end and the cancers may become multiple, giving to the liver and right side a peculiar nodular appearance. The duration is from one to one and one-half years.

Gall Stones

Definition.—A crystallization and cohesion of the calcareous elements of the bile, which by the peristaltic motion of the gall bladder form the concretions into a stone or calculus.

Adjustment.—Li. P.

Pathology.—The Li. P. subluxation causes pressure upon the nerves conveying the calorific impulses to the gall bladder, thus producing the excessive heat, which will crystallize the mineral matter in the bile. The minute crystals will adhere to any solid substance with which they may come in contact, and these are usually particles of bile pigment. Thus the small calculus is begun, and as time progresses it collects other crystals until the stone may attain a large size. The

crystals consist of a variety of material, but most of them consist of cholesterin and bile salts. If the stone is cut in two the various layers can be seen, some darker than others, which indicates that at times the bile contains more pigment or coloring matter than at other times. The number of stones will vary from one to three or four hundred.

Nerve Tracing.—Gall stones may exist with little or no tenderness traceable from the spine to the region of the gall bladder. If tenderness is traceable it follows the usual course, as previously described.

Symptoms.—Gall stones are also known as cholelithiasis, and so long as the stones remain in the gall bladder they may present no symptoms other than upon abdominal palpation in the region of the gall bladder a slight degree of gall stone crepitus may be felt. This, however, would be only possible in a thin individual and when many stones existed in the gall bladder. As soon as a stone leaves the gall bladder and begins to pass through the cystic duct intense pain is produced. This is known as hepatic colic.

Hepatic colic begins suddenly with an attack of excruciating pain located in the right hypochondriac region and radiating upward and to the right into the right shoulder and right arm. The pain is agonizing, and the patient may roll around upon the floor in a drenching sweat and with an expression of intense suffering upon the face. The abdominal and all other muscles are in a state of contraction, thus preventing normal respiration and possibly producing a slight cyanosis. The face is flushed and covered with perspiration, the conjunctiva is jaundiced, and this jaundice may be noticeable over the entire body; there may be vomiting and sometimes syncope. In a few cases there is a slight fever of 101 or 102 degrees, with a feeble and rapid pulse and extreme prostration. The liver may be swollen and tender, the urine may contain bile pigment and the stool be of a light color, but after the passage of the stone the stool may contain a large quantity of green bile which had previously, during the

passage of the stone, been dammed up in the liver and gall bladder. The attack may last from a few hours to a week or longer, with intermissions while the stone is in a resting state, but as soon as it again begins to move the pain reappears.

Although the pain is intense and the prostration great, but few cases are fatal, and those that are fatal usually succumb to syncope.

It is necessary to distinguish between hepatic colic and right renal colic. The pain of right renal colic begins in the back about the region of the kidney and extends obliquely across the lower part of the abdomen, while in hepatic colic the pain is located in the right hypochondriac region and radiates into the right shoulder; in renal colic there is hematuria and no jaundice, which is reversed in hepatic colic. In renal colic the stone may be passed with the urine shortly after its passage through the ureter, and in hepatic colic the stone will be passed with the fecal matter.

In appendicitis the pain is localized at McBurney's point, and there is no right shoulder pain or jaundice. The fever of appendicitis is higher and more constant, and the urine contains indican and not bile. The palpation and nerve tracing will further differentiate between the two.

Acute Cholecystitis

Definition.—An inflammation or excessive heat in the gall bladder, characterized by jaundice and severe pain.

Adjustment.—Li. P. and K. P.

Pathology.—The local liver place subluxation causes an impingement upon the calorific nerves leading to the liver and causes an inflammation. The inflammation produces a swelling and hyperemia of the membranes and vessels of the organ, and the mucous membrane lining the bladder gives off a mucopurulent exudation, which passes off with the bile. When the external surface is involved there is an effusion of

serum from its external surface, and adhesions may occur between the gall bladder and surrounding structures.

Nerve Tracing.—The degree of tenderness in this incoordination is very great and is traceable from the intervertebral foramen in the region of Li. P. outward over the scapular region, beneath the axilla to the right hypochondriac region immediately over the gall bladder.

Symptoms.—This begins rather suddenly, with pain, mild at first, but later becoming severe, located in the upper and right part of the abdomen. This pain steadily increases in severity and is accompanied by anorexia, nausea and vomiting. The degree of prostration and localized tenderness is very great; there is a moderate jaundice, respiration is painful and is of the superior costal type, as the abdominal muscles are retracted; there is constipation and sometimes attacks of hepatic colic. The symptoms will vary according to the extent and kind of inflammation present. If the inflammation should become suppurative there will be irregular chills, fever and sweats and great prostration. An abscess may form from the accumulated pus, with its attending symptoms.

Hyperemia of the Liver

Definition.—An abnormal fullness or overdilatation of the blood vessels of the liver with blood.

Adjustment.—Li. P. This local subluxation produces pressure upon the motor nerves leading to the minute muscular fibres of blood vessel walls, causing them to lose their normal tonicity, thereby becoming dilated and congested with blood.

Pathology.—The vessel walls become relaxed, as described above, and the liver becomes enlarged and congested. If the congestion is very marked it gives to the liver a peculiar appearance known as the nutmeg liver. In the passive form there may, in addition to the above described condition, be some obstruction to the return of the blood from the liver, such as cirrhosis of the liver, in which the capsule of Glisson is thickened and presses upon the vessels which are imbedded

in it, or pressure upon the inferior vená cava, or valvular disease of the heart, which interferes with the systemic circulation. Any or all of these would add to the degree of congestion.

Symptoms.—There may be slight tenderness, having a course and distribution similar to that of other diseases of the liver. In the active form the only symptom present is a sensation of fullness and discomfort in the right side of the abdomen after eating a hearty meal. This is due to the fact that more blood is needed in the liver during the formation of bile, which is required for digestion, and which is being secreted during gastric digestion. The vessel walls are weak and stretched to an unusual degree with this added supply of needed blood. The adjustment of the subluxation at Li. P. would restore the normal flow of motor impulses to the vessel walls and give to them their normal tonicity, whereby they would be able to withstand the added pressure due to the additional supply of blood during digestion.

The passive type is much less common, and in this form the hyperemia is continuous, giving rise to the nutmeg liver. The liver becomes greatly enlarged and the lower border may be palpable as low as the horizontal umbilical line. If there is tricuspid incompetency the entire organ will pulsate during the systole of the heart. There is a feeling of weight and discomfort in the right hypochondrium, and upon palpation considerable tenderness may be elicited. There may be a slight jaundice, the stools are clay colored, the urine is dark and contains bile pigment, there may be ascites, enlarged spleen and marked gastrointestinal symptoms.

The adjustment may vary slightly here, for if the valvular incompetency of the heart was an important factor in the production of the congestion it would be necessary to adjust H. P. to correct this incompetency. If there were a tumor pressing upon the inferior vena cava it would be necessary to adjust locally for that tumor, as would only be determined by careful analysis of each individual case.

Abscess of the Liver

Definition.—A circumscribed inflammation of the hepatic cells in which there is suppuration and pus formation, characterized by tenderness and disordered function of the organ.

Adjustment.—Liver place and K. P.

Pathology.—This is also known as suppurative hepatitis, and the abscess may be single or multiple. The beginning inflammation is attended by hyperemia and swelling throughout the circumscribed area. The inflammation being of a suppurative character, the hepatic cells which are involved soon undergo disintegration and pus forms. The pus forming area is soon encapsulated by a membrane called the pyogenic membrane. This may finally rupture and discharge the pus; or the pus may be absorbed and the site of the abscess will be marked by a scar.

Nerve Tracing.—Tenderness is traceable from the region of the fourth dorsal vertebra beneath the axilla to the right hypochondriac region over the liver.

Symptoms.—This begins with hepatic and right shoulder pain of a dull aching character, and is increased in severity at times, as in deep breathing, lying upon the left side and in fast walking. The pain radiates up into the right shoulder. There is slight jaundice and an irregular fever of 101 to 105 degrees. If the abscess is large or if they are multiple there are recurrent chills, fever and sweats. Deep breathing forces the diaphragm downward, so that it may press upon the abscess and is extremely painful, hence deep breathing is suppressed. The patient will lie upon the affected side. There is gastric and intestinal symptoms, consisting of anorexia, nausea, and at times vomiting; the bowels are constipated, but should the abscess be drained into the intestines there will be diarrhoea containing pus. The liver is enlarged and tender, and if the abscess be located superficially it may be palpable, providing the degree of tenderness is moderate enough to permit palpation. The liver is smooth and tender and may reach as low

as the umbilicus. Many of the lymphatic and abdominal glands may be swollen, though no marked symptoms may come from them.

The abscess may perforate into the peritoneal cavity, with an accompanying peritonitis, or into the intestine. In other cases the pus may be absorbed, giving rise to pyemia, and it is in these cases that K. P. should be given careful attention so that elimination may be at its maximum.

Cirrhosis of the Liver

Definition.—An incoordination in which there is hypertrophy of the connective tissue of the organ and an atrophy of the secreting cells.

Adjustment.—Li. P. and K. P.

Pathology.—There are two forms, atrophic and hypertrophic. Atrophic cirrhosis is most frequently found in subjects of chronic alcoholism and begins with an excessive heat in the connective tissue of the organ, especially involving Glisson's capsule. The entire organ becomes enlarged as a result. As the connective tissue increases in bulk it contracts, thus compressing the functioning cells and causes their atrophy, and at the same time it effects a marked decrease in the size of the organ. On account of this contraction the vessels passing through the connective tissue are compressed and partially obstructed, producing venous stasis. This is most commonly seen in the portal vein, and because of the stasis which results the stomach and intestines are congested and have disordered function.

In **hypertrophic** cirrhosis the connective tissue becomes hypertrophied as in the atrophic form, but there is no inclination toward contraction in this form, hence the liver becomes and remains enlarged. However, in this form the internal connective tissue of the lobules is hypertrophied and contracts, causing obstruction to the drainage of bile, and, as a result, produces jaundice.

The nerve tracing is as in other affections of the liver.

Symptoms.—Atrophic Form.—The extent of the hypertrophy often reaches its height before any symptoms are manifested, at which time there is portal obstruction with its attending symptoms. The appetite is lost and there are nausea and vomiting. Epistaxis is common, and also hematemesis. The tongue is coated and the breath has an offensive odor, the urine is heavily colored, but there is little or no jaundice. There is often an irregular fever of 100 or 101 degrees, which may be present at times and absent for weeks. There is ascites, which is a common and characteristic symptom of the portal obstruction. The superficial abdominal veins are distended and can be plainly seen upon inspection. There is a dull headache and great emaciation of all parts of the body, which, with the abdominal distention, gives to the patient a peculiar and characteristic posture. There is an adaptative lordosis in the upper lumbar region. The face is pallid, but may have a few distended veins. In the early stages the liver is enlarged, but later atrophies and becomes hard. If the ascites is not too great the lower border of the organ can be palpated, and is found to be hard and firm. The spleen may also be enlarged and hard, and even palpable in some cases. The duration is variable, depending upon the general bodily resistance, which is greater in some individuals than in others. It usually lasts several years.

Hypertrophic cirrhosis is marked by a slight jaundice at the onset, which may become marked before the height of the condition is reached. The liver is evenly enlarged and hard. Upon palpation it is found to reach down to the umbilicus, and may be accompanied by splenic enlargement. There is a dull aching pain in the hepatic region, which is sometimes accompanied by nausea and vomiting. The stools are clay colored and the urine contains bile pigment. There may be slight fever, but there is no ascites nor distention of the superficial abdominal veins. The duration, as a rule, does not extend two years and the termination is often sudden, with high and irregular fever.

The proliferation of the connective tissue is a direct result of excessive heat, which is caused by an Li. P. subluxation. Therefore, by adjusting the Li. P. subluxation and removing the pressure from the calorific nerves leading to the liver, the normal flow of calorific impulses will be resumed. This being done, the expression of heat in the liver will be normal, further proliferation will be stopped and a process of adaptation will occur, whereby the surplus quantity of connective tissue will be broken down and will undergo disintegration, thus restoring the organ to normal.

Fatty Liver

There are two varieties of fatty liver, fatty infiltration and fatty degeneration. Fatty infiltration is an incoordination in the metabolism of the liver, in which there is an excessive deposit of fat among the hepatic cells.

Fatty degeneration is an incoordination of the metabolism of the organ in which the hepatic cells undergo a degenerative change, being transformed into an oily substance.

Adjustment.—Li. P. and K. P.

Pathology.—In fatty infiltration there is simply an excessive accumulation of normal fat upon the connective tissue of the organ, and there is no structural change in the hepatic secreting cells themselves.

In fatty degeneration the individual hepatic cell undergoes a degenerative change, due to improper metabolism. Fatty globules are deposited in the cells and the functioning portion of the cell is transformed into an oily substance, making the organ enlarged and smooth.

The nerve tracing is as in the other forms of hepatic disease.

Symptoms.—**Fatty Infiltration.**—This may be a part of general obesity, and occurs where there is a marked deficiency in the oxidation of the food in the liver, hence the fatty accumulation. The liver is enlarged, but is painless. It may extend as low as the umbilicus, and upon palpation will feel firm

and smooth. The stools may be pale because of undersecretion of bile.

Fatty Degeneration.—This is a more grave affection and begins with general malaise, headache, anorexia, and sometimes vomiting. After a short duration of the above named symptoms, jaundice will appear and gradually deepens, with clay-colored stools, bile-tinged urine, furred tongue, subcutaneous hemorrhages, and finally cerebral symptoms with the typhoid status, which is followed by death.

Amyloid Liver

Definition.—An incoordination of the liver in which there is a deposit of or a degeneration of the tissues into a substance called amyloid. This amyloid is an albuminoid substance and is so named from its resemblance to starch granules.

Adjustment.—Li. P. and K. P.

Pathology.—The liver loses its normal color, becoming pale, and is greatly enlarged. This enlargement is the result of a deposit and the formation of the amyloid material, which first begins in the vessels of the organ and later spreads throughout the parenchyma of the entire liver. Similar changes may be found in the spleen and kidneys, and are common in the tertiary stage of syphilis.

Symptoms.—The onset is gradual and the liver becomes greatly enlarged. It is smooth, soft and not tender, and can be palpated. The stools are clay colored from suppression of the biliary secretion. The urine is greatly increased in quantity and is found to contain an abundance of albumen and amyloid casts.

The patient becomes emaciated and weak, and there is usually diarrhœa. The skin is pale, indicating anemia, and at times may be slightly jaundiced. The duration is variable. This is mainly a nutritional disturbance, and is caused by pressure upon the nutritive nerves emitting from Li. P. and leading to the liver. The decrease of the nutritive impulses causes a perversion of the metabolism of the organ, so that

the food brought to it cannot be utilized by the organ in the way that it should be used, but on the contrary this food is converted into a substance not normally belonging to the body and occupies the room that should be occupied by the newly developing cells.

The proper adjustment will induce normal nutrition and conversion of food products into healthy liver cells.

Carcinoma of the Liver

Definition.—A malignant, epithelial tissue growth occurring in the liver and progressively destroying its cells, characterized by emaciation, cachexia and disordered function of the liver.

Adjustment.—Li. P. and K. P.

Pathology.—There are only two organs in which cancer is found with a greater degree of frequency than in the liver. They are the uterus, in which it is most frequently found, and the stomach. Cancer of the liver is usually multiple, but may be single. The new cells accumulate as small nodules in various portions of the superficial vessels and gradually increase in size until the process of degeneration sets in, when they become massive and decay. The hepatic cells atrophy, but the organ is enlarged by the formation of the growths. Colloid degeneration occurs as in the other forms of cancer. The course of tenderness is as in previous disorders of the liver.

Symptoms.—Anorexia of long standing is the first symptom of hepatic cancer and is followed by a sensation of weight and discomfort in the right side, which is increased after eating a medium or hearty meal. Later the patient complains of a dull, aching pain in the right side over the region of the liver, which radiates into the right shoulder. The patient becomes emaciated and weak and soon jaundice appears, and may be accompanied by the cancerous cachexia, but the cachexia may be hidden if the jaundice is deep. The pain takes on the gnawing character, and the vomiting becomes

persistent upon eating. Bile and blood may be vomited and also passed through the bowels. Upon inspection the abdomen can be seen to be nodular, and the various growths can be palpated and are of a firm, hard consistency. These symptoms increase in severity, with fever in the late stages, terminating in death within one year.

DISEASES OF THE PANCREAS

Acute Pancreatitis

Definition.—An acute inflammation or excessive heat of the pancreas, affecting the parenchyma and interstitial tissue.

Adjustment.—Eighth dorsal in combination with K. P.

Pathology.—There are three forms of the affection, hemorrhagic, suppurative and gangrenous. During the early stages all forms are alike and are characterized by great enlargement and hyperemia of the entire organ, but especially of the interstitial tissue. There is an infiltration of serum in the parenchymatous cells which interferes with the secretion of the pancreatic juice and permits the passage of fat with the stool without any digestion.

In the late stage hemorrhage may occur, filling up the areolar tissue spaces, the lobular ducts and other adjacent tissue.

If suppuration occurs it is called suppurative, and forms small abscesses, formed of the effused blood and degenerating cells.

The gangrenous form is still a later stage, in which the entire affected part of the organ is converted into a soft, offensive smelling mass of necrosis.

Nerve Tracing.—Tenderness is traceable from the 15th intervertebral foramen on either side following the course of the intercostal spaces to the middle of the epigastric region, where tenderness is diffuse.

Symptoms.—The onset is rather sudden, with severe, deep-seated pain in the upper part of the abdomen. There is

soon distention of the epigastric region, and great tenderness is present. The pain extends horizontally across the abdomen and may radiate into the left shoulder in the region of the lower angle of the scapula. There is a slight or moderate temperature, which may begin with a chill shortly after the onset of the pain. There is dyspnoea, cyanosis, hiccough and fatty diarrhoea. The dyspnoea results from the pressure of the diaphragm against the tender and sensitive pancreas, and the fatty stool results from suppression of the pancreatic secretion which digests the fat. Finally the symptoms of collapse may appear, which indicate the occurrence of hemorrhage.

The cardinal symptoms of simple pancreatitis are a sudden deep-seated pain in the epigastric region midway between the ensiform appendix and the umbilicus, vomiting, and finally shock or collapse.

If suppuration takes place there will be a rapid elevation in the temperature and the fever will run an irregular course, with recurring chills, fever and sweats. As soon as either suppuration or gangrene occurs there will also be indicanuria and leucocytosis. The two latter forms are fatal within one or two weeks.

The local eighth dorsal adjustment will restore normal calorific impulses in the substance of the pancreas, and the K. P. adjustment is for the purpose of increasing the normality of the kidneys so the elimination will be at the maximum, and thus rapidly excrete the poisons and toxins that are being absorbed from the affected region.

Chronic Pancreatitis

Definition.—An incoordination of the pancreas in which there is an overgrowth of the interstitial connective tissue, increasing the size and density of the organ and compressing the secreting structure.

Adjustment.—Lower S. P. and possibly K. P.

Pathology.—This begins and progresses slowly, with slight engorgement and swelling of the connective tissue of

the pancreas. Upon being subjected to prolonged and excessive heat the connective tissue corpuscles proliferate, thus increasing the bulk of the interstitial substance. The entire organ remains enlarged and hard.

Symptoms.—The degree of tenderness is slight, but follows a course similar to the acute form. There is a dull, aching pain situated deeply in the epigastric region, which may be more or less continuous, but usually paroxysmal. If the pancreas is greatly enlarged the head may press upon the common bile duct and produce jaundice. There will be fatty diarrhoea at times on account of the improper secretion of the pancreatic juice. During the attacks of pain the face has an anxious expression, and there is a feeling of faintness. Slight fever may be present in a few cases, and it is for this that K. P. is adjusted.

Hemorrhage of the Pancreas

Definition.—A condition of the pancreas in which there is a relaxation of the muscular fibres in the walls of the blood vessels, permitting their separation so that the blood may ooze out into the substance of the organ.

Adjustment.—Specifically at lower S. P.

Pathology.—The lower S. P. subluxation causes pressure upon the motor nerves leading to the minute muscular fibres of the blood vessel walls, causing them to lose their tonicity and to relax to such an extent that they separate and permit the oozing of blood from the vessel into the surrounding tissue.

Symptoms.—The onset is sudden, with sharp, colicky pain in the middle of the epigastric region, accompanied by nausea and vomiting and the symptoms of collapse.

The facial expression is anxious and there is a fear of impending death, the temperature drops to subnormal, the skin is pale and covered with cool perspiration, the pulse is rapid and feeble, the respirations are hurried and shallow, there is a feeling of suffocation, the abdomen is tender and distended, the apex beat weakens and finally becomes im-

perceptible; blood may appear at some of the bodily orifices, and death results.

Carcinoma of the Pancreas

Definition.—An excessive accumulation of parenchymatous pancreatic cells, in which there is colloid degeneration and a varying amount of suppuration.

Adjustment.—Eighth dorsal in combination with K. P.

Pathology.—This is very rare, and usually affects the head of the pancreas. The growth consists of new epithelial cells situated upon a fibrous stroma. During the early stages there is no decay and rapidly the tumor progresses in size, often pressing upon the duodenum or the common bile duct, and at the same time obstructing the duct of Wirsung. Later the growth becomes the site of colloid degeneration and decay.

Nerve Tracing.—Tenderness is traceable from the 15th intervertebral foramen on the right side and follows a course along the intercostal spaces to the right half of the epigastric region over the head of the pancreas, which lies in the curve of the duodenum.

Symptoms.—This begins insidiously, with dull, aching pain in the right side in the region of the pancreas. The pain is situated deeply and is subject to exacerbations at irregular periods. There are nausea, vomiting and pressure symptoms from the growth pressing against other abdominal organs. From pressure upon the common bile duct there will be jaundice that may make the condition simulate cancer of the liver; pressure upon the pylorus or duodenum may interfere with the working of the pyloric valve and permit the regurgitation of bile into the stomach, and pressure upon abdominal veins will cause venous stasis. There are great emaciation, weakness and the development of cancerous cachexia, with fatty stools.

Palpation may reveal a tumor in this locality, which would confirm the analysis with the above symptoms, providing, however, that symptoms point directly to cancer, if cancer of

the stomach, cancer of the transverse colon and aortic aneurism are absent.

Pancreatic Cyst

Definition.—An abnormal condition in which there is the formation of a large quantity of fluid in the tissue of the pancreas.

Adjustment.—Eighth dorsal.

Pathology.—This most commonly occurs when a calculus during its passage becomes lodged in the lower portion of the duct of Wirsung, obstructing the flow of pancreatic juice and causing it to be retained in the gland. In this the duct becomes immensely dilated and the substance of the organ becomes the wall of the cyst. A similar cystic condition might result from obstruction of the duct by a cancer or other growth.

Nerve Tracing.—Tenderness is traceable from the 15th intervertebral foramen on either side to the middle of the epigastric region over the region of the pancreas.

Symptoms.—If the obstruction is the result of impacted calculi there is usually a history of colic, produced by the passage of the calculus to the point where it becomes lodged. This colic is very similar to hepatic colic, except that jaundice is absent and the pain is referred to the left shoulder rather than the right. If the obstruction is from other conditions than calculi the cyst may attain considerable size before any signs are manifest. There are nausea and vomiting, with a steady pain and feeling of abdominal fullness. The epigastric region soon becomes distended and pressure symptoms arise. The pressure symptoms are referable to the organ pressed upon, and are usually the stomach, liver, spleen and colon. Upon palpation the tumor may be felt, but it is difficult to palpate the pancreas, as it lies so deeply in the abdomen behind the stomach. The stools will contain undigested fat, because of the absence of pancreatic juice in the intestines. If the calculus should pass, the cyst will immediately disappear.

Pancreatic Calculi

Definition.—The crystallization and cohesion of the calcareous elements in the pancreatic juice produced by the action of excessive heat, or the result of abnormal secretion.

Adjustment.—Eighth dorsal.

Pathology.—The local eighth dorsal subluxation causes pressure upon the calorific nerve leading to the pancreas, and produces excessive heat in that organ. The effect of the prolonged heat is such that it produces a crystallization of the mineral elements in the pancreatic juice. The minute crystals adhere to particles of epithelium, or to each other, and form a small grain, which collects other crystals until a rounded, hard calculus is formed. The calculus thus formed may become attached to the membrane lining the duct wherein it is formed and it may remain there without giving any indications of its existence, but if it passes through the duct the delicate and sensitive mucous membrane is scratched and the symptoms of colic are produced.

Symptoms.—The onset of the pain is sudden, with a feeling of faintness and, possibly, nausea and vomiting. The patient is cramped, the respiration is suppressed, cyanosis may result, the face has an anxious expression, the skin is pale and may be covered with perspiration. The pain is agonizing and extends along the left costal margin into the region of the angle of the left scapula to the spine. There are glycosuria and fatty stools, both of which occur because of a lack of the pancreatic secretion.

The adjustment of the causative subluxation at eighth dorsal vertebra will permit the normal transmission of mental impulses to the gland, thereby restoring heat to normal and preventing the further formation of mineral crystals. The secretion will also assume its normal character, and its effect upon the already formed calculus is such as will aid its disintegration.

DISEASES OF THE PERITONEUM

Acute Diffuse Peritonitis

Definition.—An acute inflammation or excessive heat of the peritoneum, characterized by fever, pain and prostration.

Adjustment.—First or second lumbar, or local with K. P. and C. P.

Pathology.—The lumbar subluxation causes impingement of the calorific nerves distributed to the peritoneum, and this brings about excessive heat or inflammation of the serous membrane. During the early stages there is a hyperemia of the blood vessels and a dryness of the surface of the membrane. Later there is an exudation of a fibrinous serum from the free surface, which may vary in quantity according to the severity of the inflammation. If slight it may serve as a cementing material, which is conducive to adhesion. When the effusion or exudation is large there is a condition of dropsy of the peritoneal cavity, known as ascites. During the period of absorption the fibrinous portion of the exudate may remain and form adhesions, which will wall off any localized purulent exudation. If the condition is prolonged the effused serum may undergo suppuration and will be transformed into pus. This is called purulent peritonitis.

Nerve Tracing.—There is no specific tracing in case of peritonitis, as the tenderness is so diffuse. Local tenderness may be found near the spine in the region of the causative subluxation.

Symptoms.—Acute peritonitis is manifested by a sudden onset, with a chill and a fever ranging from 102 to 105 degrees. There is intense pain scattered over the entire abdomen, and in order to minimize this pain the thighs are flexed upon the abdomen and the abdominal muscles are retracted. Respiration is of the superior costal type and is very rapid, the pulse is bounding and rapid, the spleen is enlarged and tender, the urine is scanty, highly colored and contains indican, the abdomen is distended by the effused serum, the

heart is displaced and the lungs are compressed by the contraction of the diaphragm in the attempt to lessen the pain. The stomach, liver and spleen may be displaced by the effusion and muscular contraction. There is intense thirst and great prostration. Talking, walking and coughing increase the pain and are accordingly suppressed. There may be vomiting, and, if present, is extremely painful, as the two inflamed layers of the peritoneum are rubbed against each other. The facial expression is anxious, the upper lip is elevated so as to uncover the upper teeth, and is called the Hippocratic countenance; the cheeks are collapsed, the eyes are sunken, the features are pinched, the lips are cyanotic, and the signs of collapse may appear. In case of collapse the temperature rapidly falls to the normal or subnormal, the skin becomes cold and clammy, the pulse feeble, the respiration short, sighing and shallow, and death occurs.

By adjusting the local subluxation the inflammation is reduced and the heat restored to normal, the effused serum is absorbed and recovery takes place. The adjustment of C. P. and K. P. is for the purpose of restoring the general bodily heat to normal and for the elimination of excretory substances.

Acute Localized Peritonitis

Definition.—An inflammation or excessive heat confined to a local part of the peritoneum.

Adjustment.—Local, depending upon the part of the peritoneum involved, in combination with C. P. and K. P. If the local inflammation is in the region of the vermiform appendix or ovary, the local adjustment should be made at second or third lumbar vertebra. If it is a subphrenic peritonitis the local adjustment will be from the fourth to the eighth dorsal vertebræ, as will be determined by palpation and nerve tracing, the tracing being very distinct from the cause to the region over the inflamed part.

Pathology.—Acute localized peritonitis is usually associated with an inflammation of some other abdominal organ, such as the appendix, ovary, uterus or liver, and the changes noted are the same as in the diffuse form. There is an early hyperemia and swelling of the peritoneum in the circumscribed area affected. The free surface becomes dry and red, and is very painful when brought in contact with another surface. From this dry surface an exudate which is rich in fibrin soon appears and may become very profuse in quantity, producing a local dropsy in that part of the abdomen. Later, during the stage of absorption, the fluid part of the effusion is readily absorbed, but the fibrinous part remains, forming a cementing substance, which is a material factor in the production of adhesions.

Symptoms.—The symptoms are about the same as the acute diffuse form, except that they are localized in a specific part of the abdomen. This begins suddenly, with a slight chill or chilliness, and is followed by a rapid rise in the bodily temperature to 102 or 103 degrees. There is a moderately severe pain in the abdomen, which is increased upon motion, deep breathing, coughing or vomiting. The bowels are constipated, the urine is scanty and highly colored, and may contain indican. The tongue is coated and there is an offensive odor with the breath. In order that the pain in the abdomen may be minimized, the thighs are flexed upon the abdomen, the abdominal muscles are retracted, the patient lies upon the back, and the respirations are short, shallow and of the superior costal type. If the localized peritonitis is localized on one side the patient may lie upon the affected side, and the retraction of the abdominal muscles will be limited to the side affected. There is marked local tenderness over the region affected and there may be distention of the abdomen at that point. Although painful, vomiting does occur, and the vomitus contains bile which is sometimes blood stained.

In case of subphrenic peritonitis the effusion may dis-

place the liver, pancreas, stomach or spleen, as can be determined by palpation and percussion. The diaphragm will be contracted to lessen the pain, and, as a result, the apex beat of the heart may be displaced and the lungs will be compressed, making oxygenation low and possibly producing cyanosis. There are friction sounds produced by the rubbing of the two inflamed layers of the peritoneum. If absorption does not take place in a sufficient length of time suppuration will occur, producing a condition of empyema of the peritoneum. This is marked by repeated chilliness, a high and irregular fever, with profuse sweats, great prostration, and, finally, cerebral symptoms of delirium, stupor and coma.

Many cases of localized peritonitis have come within my observation that have entirely recovered from the attack under specific Chiropractic adjustments. The adjustment relieves the pressure on the calorific nerves, permitting a restoration of the normal heat, whereby the hyperemia and swelling subside and the painful symptoms disappear.

Chronic Peritonitis

Definition.—A slight and prolonged inflammation of the peritoneum, in which it becomes greatly thickened and indurated. This may be either localized or diffuse, as in the acute form.

Adjustment.—K. P. and local, according to the part of the peritoneum affected, and if diffuse the local subluxation is in the upper lumbar region.

Pathology.—This may be a prolongation or continuation of an acute attack, but more commonly it is either tubercular or cancerous, with adhesions and proliferation of its connective tissue elements. In the early stages there are hyperemia, swelling, exudation and often adhesions. At a later period there is a proliferation of the connective tissue corpuscles, which results in a thickening of the peritoneum involved. After this proliferation takes place adhesions will form, matting the intestines and folds of peritoneum together, thus

disturbing the relation of the abdominal viscera. There may be sacculated portions of the peritoneum containing serum which has been effused, and which may still, in the chronic stage, undergo suppuration.

The nerve tracing is as in the previous forms.

Symptoms.—When localized there are practically always adhesions of some of the abdominal viscera, especially the vermiform appendix and its part of the mesentery, the liver, spleen and other pelvic organs. It may be possible to recognize and locate the adhesions upon inspection, as that part of the abdomen is often drawn inward, and upon palpation feels like a band or cord. The adhesions may compress the intestines and effect obstructive constipation, and there is more or less colicky abdominal pain. When the inflammation is diffuse it is more commonly tubercular, and found in a patient having a tubercular diathesis. The patient is thin and may be continually losing flesh and strength; there is abdominal discomfort which at times amounts to pain, either dull or aching or sharp and colicky; there is usually constipation, but in a few cases there is diarrhœa; there is a daily afternoon rise in the bodily temperature and may be accompanied by night sweats. Tubercular nodules may be palpable upon abdominal palpation, and these nodules may coalesce so as to form large tumor-like masses that will press upon the abdominal organs and give rise to pressure symptoms from those pressed upon.

If there is a tubercular inflammation it may be extended to the intestines and other abdominal viscera. Small tubercular masses may form and coalesce in the intestinal tract, and will produce the symptoms of intestinal obstruction, with fecal vomiting and great prostration. This complication is not common.

Carcinoma of the Peritoneum

Definition.—A malignant epithelial tissue growth in which there is colloid degeneration and decay.

Adjustment.—Local in combination with K. P.

Pathology.—As in other cases of carcinoma, this begins as a simple tumor, being composed of epithelial cells situated upon a fibrous stroma. However, as the growth increases in size the degeneration begins, and is carried on at a very rapid rate, in comparison with other degenerations. The cells first formed are first affected by the degeneration and soon are in a state of necrosis. Portions of the tumor slough off with pus, and as it enters the intestine, may be found in the stool. The growth continues to expand from below and may spread in area, there frequently being the formation of many more growths toward the end.

Nerve Tracing.—Tenderness is traceable from the region of the local subluxation outward, around the side of the region over the tumor, and may become diffuse at this point.

Symptoms.—So long as the growth is small and no pressure symptoms are present the patient may be ignorant of any effect. As soon as it attains sufficient size pressure symptoms will be manifest. Among these are ascites from pressure upon veins, constipation from pressure upon the intestines, gastric irritation from pressure upon the stomach, and feeble pulse in the femoral artery from pressure upon that artery.

There is a dull, aching, burning, itching, or gnawing pain felt in the region of the growth. The growth may be palpable. The patient loses flesh and strength progressively, and the skin becomes dark because of the development of the cancerous cachexia. The cardinal symptoms are the progressive loss of flesh and strength, the dull, gnawing pain, the cancerous cachexia, the palpable tumor, and pus in the stool.

Ascites

Definition.—An abnormal collection of fluid in the peritoneal cavity, characterized by distention of the abdomen and displacement of the abdominal viscera.

Adjustment.—The adjustment always includes K. P., but, in addition, requires a local adjustment, and this local adjust-

ment may be very variable, depending upon the condition which produced the ascites. This may occur in connection with valvular trouble of the heart, in which case H. P. is local, or it may occur in portal overdistention, in which event Li. P. is local, or it may occur in nephritis, in which case K. P. is specific.

Pathology.—There is a collection of fluid in the peritoneal cavity and an infiltration of serum into the surrounding and adjacent tissues. This serum is transparent and of a straw color, having a specific gravity of about 1.015 and is rich in albumen and fibrin. Ascites may result from a variety of pathological conditions. They have been described elsewhere and the ascites considered as a symptom.

Symptoms.—The onset is slow and gradual, regardless from what condition the dropsy arises. The first indication is a swelling of the abdomen, but in nephritis a puffiness of the face is first seen, and in cardiac dropsy edema of the ankles is first seen. The abdomen is distended and the skin is shiny. There is scanty urination, constipation, difficult respiration from the upward pressure of the diaphragm. The abdomen becomes distended, and in order to maintain the center of equilibrium in a perpendicular manner the shoulders are thrown back and an adaptative lordosis results in the upper lumbar region. The skin may pit upon pressure, and the shape of the abdomen will change with prolonged change in the position of the patient.

Retroperitoneal Sarcoma

Definition.—An abnormal, excessive growth of connective tissue cells in which there is progressive degeneration and decay.

Adjustment.—Local in combination with K. P.

Pathology.—This growth differs from a carcinoma, in that it is not situated upon a stroma, does not have any lymphatics and is composed of connective tissue cells. These multiply at a rapid rate and form an enormous tumor. The cells, which

are early formed, begin to undergo a form of decay, which results in cachexia and later death.

Nerve Tracing.—There is tenderness leading from the local subluxation, which is usually in the lumbar region of the spine, outward around the trunk to the region over the growth.

Symptoms.—This tumor may attain a very large size without giving rise to any symptoms if it lies to one side of the median line in the back part of the abdomen. The first symptoms to appear are those resulting from the pressure of the tumor upon some abdominal viscus. There is anorexia, nausea and vomiting, with constipation and colicky or dull and aching pain from the beginning of the symptoms. The weight of the tumor produces a sensation of pressure or bearing down in the abdomen, which increases until it becomes a pain of a dull, dragging character. There may be intestinal obstruction from pressure upon the intestines, weak pulse in the femoral artery from pressure upon the aorta, edema of the lower extremities from pressure upon the inferior vena cava, and because of its immense weight, it may aid in a general splanchnoptosis. There is loss of weight and strength, cancerous cachexia appears, and upon abdominal palpation the tumor may be felt lying deeply in the back of the abdomen. The tumor may fluctuate and move with respiration, but is ordinarily firm and solid, being fastened to the muscles of the spine.

SECTION 9

**DISEASES OF THE RESPIRATORY
SYSTEM**

Acute Nasal Catarrh

Definition.—Acute nasal catarrh, also known as coryza, is an acute inflammation of the mucous membrane lining the nose and the cavities communicating with it, characterized by disorders of smell and an abnormal mucous discharge.

Adjustment.—Middle cervical, usually the fourth. There is improper elimination of bodily poisons in all catarrhal inflammations, and therefore K. P. or lumbar should also be adjusted.

Pathology.—The mucous membrane becomes swollen and its vessels are hyperæmic, which gives to it a reddish color. The normal secretion is diminished, but there is a flow of a colorless salty fluid, which later becomes mucoid or mucopurulent. The swelling is due to infiltration of serum into the structure of the membrane, therefore is edematous in character. The exudation may vary greatly in quantity and becomes more profuse as the swelling subsides.

Nerve Tracing.—Tenderness is traceable from the fourth intervertebral foramen on either side outward over the neck, upward over the angle of the jaw, in front of the ear and forward to the region of the nose.

Symptoms.—Acute catarrh is commonly spoken of as a cold in the head, and begins with chilliness along the back, headache, and general lassitude. There may be a slight fever (101), sneezing and a feeling of dryness in the nostrils, so that the patient feels more comfortable when breathing through the mouth. At first there is a thin acrid secretion from the nose, watering of the eyes, and impairment of the senses

of smell and taste. The inflammation may soon extend downward, affecting the pharynx, making it red and swollen.

The throat is then sore, the neck may become stiff, the cervical glands may be swollen; there is usually herpes of the nose and lips. If the larynx becomes affected there will be dysphonia or hoarseness, and cough may be present. There may be partial deafness, owing to the swelling of the mucous membrane at the opening of the eustachian tube. In three to five days the secretion becomes mucopurulent and is of a yellowish color, which may subside by the tenth day or merge into the chronic form, with the formation of hard crusts.

Chronic Nasal Catarrh

Definition.—Chronic rhinitis is a chronic catarrhal inflammation of the nasal mucosa, characterized by structural changes in the membrane and derangement of the sense of smell.

Adjustment.—Same as the acute form.

Pathology.—At the onset the pathology is that of the acute form, but in the later stages it takes on the form of either hypertrophic rhinitis or atrophic rhinitis.

In the hypertrophic form the membrane of the nasal passages becomes thickened, dark red in color, and there is engorgement of the blood-vessels. One or both of the passages may become closed and the sense of smell abolished.

In atrophic rhinitis the nasal cavities become enlarged because of the atrophy of the mucous membrane. Frequently there are ulcerations on the membrane, from which there exudes an offensive or fetid discharge. The secretion is thick and forms into hard, dry, green crusts.

Symptoms.—The mucous membrane readily becomes congested and the patient constantly has a cold in the head. There is more or less constant sniffing. The air passages may be partially or completely closed, and mouth breathing is the result. The voice becomes nasal, and there may be varying degrees of deafness and the formation of adenoid growths in

the nose and pharynx. Ozena is a common symptom of the atrophic form, and sometimes this form is called ozena. Under the adjustments the secretion becomes more profuse and mucopurulent at first, later becoming mucus and diminishing in quantity until normal. The time required for this is variable, depending upon the extent of the depletion of the membrane.

Hay Fever

Definition.—It is an acute inflammation or excessive heat of the mucous membranes lining the upper respiratory passages, characterized by a thin, watery discharge from the nose, difficult respiration and sneezing.

Adjustment.—The fourth cervical vertebra is the usual adjustment, but in cases where the sensitiveness extends down into the bronchi, the seventh cervical or first dorsal should be adjusted.

Pathology.—The nasal mucous membrane is swollen and congested and from it exudes a thin acrid secretion. The membrane is also excessively sensitive.

Symptoms.—Hay fever is also known as hay asthma, rose cold, and autumnal catarrh. The disease makes its appearance in attacks which usually come on during the late summer, with sneezing, irritability of the eyes and difficult breathing. There is a profuse watery discharge from the nose, the eyes are watery and red, with itching lids. The special senses of taste, smell and hearing may be greatly impaired.

When the larynx and bronchi are affected there is cough and expectoration, with severe attacks of dyspnoea. Generally constitutional symptoms are absent, but there may be anorexia, general weakness and a slight fever.

DISEASES OF THE LARYNX

Acute Catarrhal Laryngitis

Definition.—It is an acute inflammation of the mucous membrane lining the larynx, characterized by slight fever, hoarseness and a catarrhal exudate.

Adjustment.—Lower cervical in combination with S. P.

Pathology.—The membrane of the larynx becomes swollen, hyperæmic, and the normal secretion greatly diminished. The vocal cords may become swollen and lose their power of vibration, which produces aphonia.

Nerve Tracing.—Tenderness traceable from the sixth or seventh intervertebral foramen, on one or both sides, outward and forward to the region over the larynx.

Symptoms.—The onset is sudden, with a tickling in the throat, which produces a cough. The cough is dry and hoarse, or metallic. The voice becomes husky and may be completely lost, the patient speaking in whispering tones. There is dysphagia, dyspnœa and tenderness of the larynx. The respirations are short and shallow. The vocal cords are thickened and lack vibratory power. The cough is dry at first, but later is accompanied with a mucus or mucopurulent expectoration.

Spasmodic Laryngitis

Definition.—A catarrhal inflammation of the mucous membrane of the larynx, associated with a temporary spasmodic contraction of the glottis.

Adjustment.—Sixth cervical in combination with S. P.

Pathology.—Same as acute laryngitis, with a sudden contraction of the glottis.

Nerve Tracing.—The nerve tracing is the same in all cases of laryngeal disorders.

Symptoms.—This disease is also known as spasmodic croup, catarrhal croup and false croup.

The attacks are nocturnal in character and begin suddenly without any premonitory symptoms. The child awakens with a sense of suffocation, a dry, harsh, croupy cough and intense dyspnœa. The coughing occurs in paroxysms, during which time the face is cyanotic and may be covered with perspiration. After a few paroxysms the dyspnœa is partially relieved and the child recovers within a few hours. The

attacks are recurrent nightly for three or more nights, each succeeding attack being milder than the one preceding it. An adjustment during an attack produces immediate relief, and usually prevents subsequent attacks.

Chronic Laryngitis

Definition.—A continuation or prolongation of the acute form.

Adjustment.—See acute catarrhal laryngitis.

Pathology.—The swelling and redness of the acute form remains present in the chronic. In addition, the mucous membrane becomes hypertrophied and the vocal cords relaxed.

Symptoms.—The most constant symptom is hoarseness, or huskiness of the voice, which may be intensified upon the contraction of a slight cold. There is a chronic laryngeal cough with or without expectoration. Constant irritation or tickling in the throat is a prominent sign of chronic laryngitis.

The above condition and symptoms being produced by a lower cervical subluxation impinging nerves which have to do with the expression of the calorific function, restoration can be brought about only by proper adjustment of this subluxation. Under adjustments the cough becomes loose and the expectoration more plentiful as the chronic excessive heat lessens, and at first the patient may think he has a fresh "cold." Later the exudate diminishes, the voice changes back to the normal, as the swelling of the cords is subsiding, and finally all symptoms disappear.

Edema of the Larynx

Definition.—An incoordination of the larynx in which there is an infiltration of serum in the submucous and areolar tissue of the glottis.

Adjustment.—Lower cervical in combination with S. P.

Pathology.—There is usually some inflammation of the vocal cords and laryngeal membrane, with redness and con-

gestion. The loose connective tissue becomes infiltrated with serum, decreasing the size of the lumen of the larynx and diminishing vibratory power of the cords.

Symptoms.—This usually begins with sore throat and cough, similar to acute laryngitis, followed by a feeling of fullness in the throat and difficulty in breathing, which progressively increases in severity. The voice sounds muffled and gradually becomes weaker as the edema increases. The cough diminishes as the attack progresses, and is accompanied by expectoration. Soon the patient becomes cyanosed; he assumes the erect position so as to lend support to the accessory respiratory muscles. The face has an anxious expression and the individual fears suffocation. Often the analysis is made by laryngoscopic examination.

Laryngismus Stridulus

Definition.—A spasm of the muscles of the larynx, characterized by a sudden development of dyspnœa and lack of oxygenation of the blood.

Adjustment.—S. P. and lower cervical.

Pathology.—There is no structural change in this incoordination, but during the attack the muscles supplied by the inferior laryngeal nerve are in a contracted state.

Symptoms.—This is also called **child-crowing**; **thymic asthma**, and **spasm of the glottis**. It most frequently occurs in children, but may occur in adults, and makes its appearance during the night when the child suddenly awakens with a sense of suffocation, a croupy cough and great dyspnœa. The breathing ceases, the face becomes congested and cyanotic, and all of the accessory muscles of respiration are brought into play. Finally there may be slight cough, whereupon the spasm ceases and the dyspnœa and cyanosis disappear. Often the spasm terminates with a high-pitched crowing inspiration. The attack may be accompanied with convulsions in children. The duration of the entire attack

is less than an hour, and there may be several attacks in succession, but death rarely, if ever, occurs.

Tuberculosis of the Larynx

Definition.—This is also known as tuberculous laryngitis, laryngeal phthisis and consumption of the throat. It is a tubercular inflammation of the larynx, characterized by ulceration, general weakness and emaciation.

Adjustment.—Lower cervical, S. P. and K. P.

Pathology.—At first the mucous membrane may be excessively red and contain but few tubercles. Later the tubercles increase in number and coalesce, forming nodules which may undergo ulceration. For description of tubercles, see tuberculosis.

Symptoms.—The symptoms of chronic laryngitis may be present long before the condition is suspected as being tubercular. The cough is accompanied by a profuse viscid expectoration, which at times is blood stained. The voice becomes husky and there may be a complete aphonia, the patient speaking in a whisper. Swallowing is painful, and there may be dyspnœa.

The mucous membrane becomes pale, the nodules ulcerate, and the general health is greatly impaired. The patient becomes emaciated and the tubercular cachexia develops. The tubercles may form upon the mucous membrane of the bronchi, pharynx and nose, which increases the severity of the symptoms and the exudate, which is extremely annoying to the patient. Fever of the remittent type is present, as also are night sweats, so common to tuberculosis. Examination of the larynx with the laryngoscope reveals the tubercular condition with its ulcerations.

It is necessary to differentiate tubercular laryngitis from syphilitic laryngitis. In syphilis the pain is slight or absent, the ulceration progresses rapidly and affects the laryngeal cartilages as well as the membranes; the general health is but slightly impaired, and there is the history of syphilis.

DISEASES OF THE BRONCHI

Acute Bronchitis

Definition.—An acute catarrhal inflammation of the bronchial mucosa is usually bilateral and affects the first and second divisions of the tubes. It is also commonly spoken of as "cold on the chest."

Adjustment.—Bronchitis is usually caused by a subluxation of the first dorsal vertebra, may be seventh cervical or second dorsal. The adjustment should include K. P. also.

Pathology.—The first dorsal subluxation produces pressure upon the nerves having to do with the calorific function, and so interferes with its expression that excessive heat or inflammation results. The mucous membrane lining the tubes becomes swollen and its blood vessels become hyperæmic, giving to the membrane an excessive redness. From the congested mucous membrane there is an exudation of catarrhal mucus, which at first is clear, but later becomes mucopurulent. This exudate is plentiful in the latter stages and may be blood streaked from capillary hemorrhage.

Nerve Training.—The course of the tender nerves may be followed from the eighth or ninth intervertebral foramen, on one or both sides, over the border of the trapezius muscle, beneath the cavicle, becoming diffuse over the area of the tubes affected.

Symptoms.—Acute bronchitis may be preceded by or accompanied with coryza. There is slight chilliness and fever (100 to 101 degrees). The throat becomes sore, and there is slight hoarseness, with a sense of constriction in the chest, and substernal pain. The skin over and on either side of the sternum is tender upon palpation. The cough is of the characteristic bronchial type and at first is dry, but later becomes loose, and is accompanied with profuse expectoration. The expectoration gradually changes from a thick, clear mucus, as present during the early stages, to a yellowish mucopurulent exudate, which is present during the terminal stages. Large,

moist, mucous rales are prominent over the bronchial area. The respiration is accelerated, shallow, and the breathing sounds are harsh. If the condition is intensified and extended into the terminal bronchioles, pneumonia is the result.

Chronic Bronchitis

Definition.—A chronic inflammation of the bronchial mucosa, characterized by dyspnoea, cough and expectoration.

Adjustment.—See acute bronchitis.

Nerve Tracing.—See acute bronchitis.

Pathology.—There is swelling of the mucous membrane, congestion of its vessels and exudation from its follicles, as in the acute form, but in addition to this the mucous membrane is thickened, rough and inelastic, and the lumen is greatly diminished in size. The elastic and muscular coats are also hypertrophied, may contain circumscribed dilatations and the cartilages contain calcareous deposits.

Symptoms.—Two varieties of chronic bronchitis are recognized—dry catarrh, or that with the dry, hacking cough, which is usually associated with chronic laryngitis, and pharyngitis. The cough occurs more or less continuously and is accompanied by expectoration of small globular masses of viscid mucus. Moist catarrh is accompanied with profuse expectoration, paroxysmal cough, most marked in the morning, and large, moist, mucous rales. This variety is most pronounced during the winter months. The digestion may be disturbed, the breath has a foul odor, the tongue is coated, breathing is labored, and the patient may be emaciated. The dry variety is marked by a tightness in the chest, substernal soreness and hoarseness upon overuse of the voice. There may be costal soreness from the persistent coughing. It is necessary to distinguish chronic bronchitis from chronic tuberculosis, as the latter begins with a dry bronchial cough. In bronchitis the tubes leading to both lungs are generally affected and there is absence of the failure of the general health. Chronic phthisis is usually unilateral, there is progressive

emaciation, hectic fever, weakness, night sweats and development of the tuberculous cachexia. The physical signs of tuberculosis are also localized. Vertebral palpation and nerve tracing will assist in determining the exact location of the trouble, after which its character is readily recognized.

Bronchiectasis

Definition.—A form of chronic bronchitis in which there is the formation of saccules in the bronchial tubes, filled with a putrid secretion. This may be unilateral or bilateral, and may involve one or many of the tubes.

Adjustment.—Upper dorsal, usually first or second, in combination with K. P.

Pathology.—The impingement produced by the vertebral subluxation in the upper dorsal region interferes with the transmission of both motor impulses and calorific impulses, thus not only producing an inflammation of the mucous membrane, but also producing a loss of the muscular tonicity in the muscular fibres of the bronchial muscles, causing them to dilate, thus forming the saccules. The saccules contain a purulent exudate, which exudes from the mucous membrane and is expectorated periodically.

Symptoms.—Bronchiectasis is always preceded by chronic bronchitis; in fact, it is a form of chronic bronchitis where the secretion becomes purulent. There is cough, occurring in paroxysms during the morning. During sleep, when the individual is in the recumbent posture, the secretion accumulates in the saccules; when the position or posture is changed in the morning the sac overflows; the purulent secretion coming in contact with the healthy mucous membrane below, irritates it, so that cough and profuse expectoration results. The amount of expectoration depends upon the number and size of the saccules. After the sacs are emptied there is a period of rest until they again fill. Upon standing the expectorate separates into three layers. The upper layer consists of a brownish froth, beneath which is a thin, yellowish

mucoid layer, and in the bottom there is a deposit of sediment containing pus, mucus and destroyed epithelium. If suppuration is extensive the odor is very offensive. If the dilatations are very small the symptoms of chronic bronchitis will supervene. Rales are common, and there may be small hemorrhages.

Bronchiectasis may simulate tuberculosis, in that the signs of a cavity may exist in both, but in tuberculosis the regular hectic fever, progressive emaciation and debility; tubercular cachexia and microscopic examination of the sputa will indicate the former.

Fibrinous Bronchitis

Definition.—A plastic inflammation of the mucous membrane lining the bronchial tubes, accompanied by the formation and expulsion of fibrinous casts. This is also known as plastic bronchitis and membranous bronchitis.

Adjustment.—First dorsal with K. P.

Pathology.—The mucous membrane becomes hyperæmic and swollen early in the affection. Later there is an exudation of grayish-white mucus, which contains much fibrin, from the follicles of the tubes. This exudate forms a pseudo-membrane which takes on the form and shape of the bronchi in which it is formed. It finally becomes detached from the mucous membrane by the process of suppuration occurring beneath the false membrane, and is expectorated as small mucous pellets. If these pellets be placed in water they can be unravelled with needles and found to be casts of the bronchi, usually of a secondary or tertiary bronchus. If the casts are placed in acid they swell and are similar in appearance to boiled macaroni.

Symptoms.—Occasionally the onset is sudden, with chills and high fever, which is followed by intense dyspnoea, violent, paroxysms of cough, and, possibly, hemoptysis. Usually, however, the onset is that of ordinary bronchitis, with slight

fever, a paroxysmal cough increasing in violence, cyanosis, and finally blood-stained expectoration. The expectoration contains shreds of false membrane in the form of casts, which characterize the disease. After the expulsion of these casts the dyspnoea is relieved and the cyanosis disappears, but returns when the tubules are again filled with the fibrinous formation. The respiration is weak, vocal fremitus is diminished, and there is deficient expansion of the affected side. The analysis depends upon finding of the casts in the expectorate.

Bronchial Obstruction

Definition.—A decrease in the size of the bronchial tube or a total closure of its opening, brought about by a growth, constriction, or pressure from without.

Adjustment.—Local, depending upon the condition producing the obstruction. Usually upper dorsal region.

Pathology.—This may be variable. Tumorous growths may form in the tube and produce obstruction. Foreign bodies, or thickening of the lining of the tube, pressure upon the tube by a mediastinal tumor, or pulmonary tumor, or pressure by a thoracic aneurism. When the obstruction is produced by a contraction of the inner bronchial muscles the condition is known as bronchial asthma.

Symptoms.—This is usually unilateral, and when the smaller bronchi are obstructed there may be no noticeable symptoms, but if a large bronchus is obstructed there is intense dyspnoea, with retraction of the upper abdominal muscles and intercostal muscles during inspiration, and deficient expansion of the affected side. There may be a slight upward movement of the larynx during expiration if a large bronchus is affected, but the extent of this movement is much less than in laryngeal stenosis. The vocal fremitus is diminished, dry rales may be present at the point of obstruction, and if atelectasis occurs there will be dullness upon percussion.

Bronchial Asthma

Definition.—A chronic affection of the bronchi, characterized by great difficulty in breathing, recurring at intervals, accompanied by wheezing sounds, a sense of constriction in the chest, and sometimes cough and expectoration.

Adjustment.—The cause of bronchial asthma is a subluxation of the first dorsal vertebra, producing pressure upon the nerves of the eighth or ninth zone leading to the bronchi. The adjustment may also include K. P.

Pathology.—There is hyperæmia and swelling of the bronchial mucosa and an exudation of mucin, together with a spasmodic contraction of the inner bronchial muscles, occurring when the lungs are filled, and producing an expiratory dyspnœa.

The impingement interferes with the transmission and expression of two functions, viz.: Motor, producing the muscular contraction, and calorific, bringing about the hyperæmia and swelling.

Adjustment of the subluxated vertebræ producing the impingement permits normal transmission and expression of mental impulses, therefore normal function in the bronchial tubes.

Symptoms.—There may be premonitory symptoms, as chills, depression of spirits, vertigo, bronchial irritation, thoracic oppression, or what is commonly called nervousness.

Nocturnal attacks of sudden onset are more common. After a few hours' sleep the patient awakens with a distressed feeling of lack of breath, and a feeling of great oppression in the chest. He assumes an upright position, bracing the arms so as to give additional support to the accessory muscles of respiration. The respiratory efforts become violent in the attempt to overcome the intense dyspnœa. The face is pale and the facial expression is extremely anxious, the patient fearing suffocation. The breathing is accompanied by wheezing sounds, speech becomes impossible, and the face is soon cyanosed. This is an expiratory dyspnœa, for the air enter-

ing the lungs is prevented from escaping by a contraction of the smaller bronchi. Very little air enters the lungs, the muscles of respiration are contracted, the eyes protrude, and the chest is barrel shaped. This paroxysm of intense dyspnoea, may last from a few minutes to several hours, and frequently subsides with a cough and slight expectoration of a thin, watery fluid. The pulse is very rapid and small, the face is covered with perspiration, and upon the expiration of the attack the patient falls into a sleep from extreme exhaustion. Microscopic examination of the sputa shows the presence of Leyden's crystals and Curschmann's spirals. The attacks may recur several times in rapid succession, or a single attack may last for several days, with remissions or intermissions of hours. Later the expectoration becomes mucopurulent, and the crystals and spirals disappear.

Patients suffering with this incoordination usually have an asthmatic hump, or marked prominence of the lower cervical and upper dorsal vertebræ. Their breathing is peculiar, in that the inspirations are short and the expirations are prolonged. They frequently have the barrel-shaped or emphysematous chest, and prominent sterno-mastoid muscles. It is very rare that the patient dies during an attack, unless there are complications existing, especially cardiac trouble.

DISEASES OF THE LUNGS

Pulmonary Congestion

Definition.—An incoordination in which there is an excessive accumulation of blood in the blood vessels of the lungs.

Cause.—This is caused by a subluxation of the third dorsal vertebra impinging the motor nerves leading to the muscular fibres forming the walls of the blood vessels in the lungs, thus causing them to become relaxed, dilated and engorged with blood.

Pathology.—The vessels are engorged. The lung tissue has a bloated and dark red appearance. There is a frothy

exudation from the mucous membrane, and the lung sinks deeper in water than the normal lung.

Nerve Tracing.—The course of tenderness leads from the tenth intervertebral foramen on either side outward over or under the scapula, under the axilla, becoming diffuse over the lungs.

Symptoms.—There are two forms of pulmonary congestion recognized—active congestion and passive congestion.

Active congestion is arterial, and may have remissions in its intensity. It also precedes inflammatory conditions of the lungs, and is characterized by a heavy, labored breathing, soon amounting to dyspnoea; a flushed face, pain, strong, full, bounding pulse, and a short, dry cough that may be accompanied by blood-stained, frothy expectoration. There may be a general fever, with the appearance of symptoms of other coexisting conditions.

Passive congestion usually results in cases of mitral stenosis or incompetency, which will interfere with the return of blood from the lungs, and when such is the case it is called mechanical. It usually develops slowly, with difficulty in breathing upon slight exertion, cough and frothy expectoration, becoming blood-stained if the congestion is severe. Cardiac symptoms would correspond to the valvular lesion producing the congestion.

If the overfullness of the vessels is favored by the position assumed by the patient, it is termed hypostatic congestion. This kind of congestion is encountered in the acute febrile diseases. The symptoms of this type are similar to the passive type, except that the cardiac symptoms are lacking.

Pulmonary Edema

Definition.—An abnormal condition in which there is an accumulation of serum in the interstitial tissue of the lungs.

Adjustment.—Third dorsal and K. P.

Pathology.—There is swelling or thickening of the lung tissue from the accumulated serum, making the lung inelastic.

The lung tissue will pit upon pressure, and will sink in water deeper than the normal tissue. If cut, a serous fluid exudes. If there is associated congestion the capillaries are engorged, and the escaping serum will be blood-stained.

Symptoms.—If the edema occurs from nephritis the pulmonary symptoms will be of gradual onset and dyspnoea more pronounced when in a recumbent posture. When purely a local effect the onset is sudden, with dyspnoea, cyanosis, cough, and frothy, perhaps blood-stained, expectoration. The compression of this interstitial swelling is upon the pulmonary vessels, and offers great resistance to the pulmonary circulation, thus throwing added work upon the right ventricle, effecting hypertrophy. Should dilatation exceed the hypertrophy the symptoms of collapse or shock will supervene, the patient sinking into a stupor. It is frequently difficult to distinguish this from pulmonary congestion, and the two may coexist in the same individual. It may simulate acute pneumonia in the early stages, but the high fever with local areas of consolidation will serve to differentiate them.

Broncho-Pulmonary Hemorrhage

Definition.—A hemorrhage or oozing of blood from the vessels of the lungs or bronchi. This condition is otherwise known as bronchorrhagia, or hemoptysis.

Adjustment.—Upper dorsal region, as will be determined by vertebral palpation.

Pathology.—The mucous membrane is usually hyperæmic. The minute muscular fibres forming the vessel walls are relaxed and slightly separated, so that the blood oozes from them. The bronchi may be filled with clotted blood. Hemorrhages may occur from tuberculous destruction of the vessel walls, or erosion of the vessel from other diseases.

Symptoms.—The amount may be small and continue for days, or there may be a rupture of a vessel large enough to produce immediate death, with the symptoms of internal hemorrhage. The hemorrhage may begin with a tickling sen-

sation in the larynx, which will induce coughing. The cough will be accompanied with a flow of warm, salty blood in the mouth. The breathing may be difficult, with a sense of constriction in the chest. The blood is of a bright red color, which distinguishes it from hematemesis. After the hemorrhage the patient may be weak, pale, feverish, and have fear of a future hemorrhage with fatal results. As a rule, however, death does not occur from broncho-pulmonary hemorrhage.

If the effused blood remains in the air sacs, signs of consolidation will be present, but this blood is usually removed by expectoration or absorption. The sputa may be slightly blood-stained for days following the hemorrhage. Severe hemorrhages have been instantly stopped by a single Chiropractic adjustment.

Embolism and Thrombosis

Definition.—Embolism is an obstruction of a blood vessel, which is carried to the point of obstruction by the blood stream. Emboli most frequently consists of destroyed epithelium or endothelium from the valves of the heart following an attack of endocarditis; or a clot containing pus cells, epithelial cells and blood cells; or portions of broken-off thrombi.

Thrombosis is an obstruction of a blood vessel which forms in situ. It consists of a local and irregular thickening of the tunica intima, and is commonly encountered in arteriosclerosis.

Adjustment.—Upper dorsal, as determined by vertebral palpation, and K. P.

Symptoms.—Embolism always occurs in the arteries, and thrombosis may occur in either arteries or veins. The obstruction may vary greatly in size. If obstructing a small vessel no noticeable symptoms may occur, and if obstructing a very large vessel instant death may result.

If a medium-sized vessel is obstructed there will be cough, dyspnoea, cyanosis, blood-streaked expectoration, and, pos-

sibly, hemoptysis. There is extreme mental anxiety, depression of spirits, syncope, and, possibly, coma or convulsions.

Pain may or may not be present at the point of the obstruction. Other symptoms of congestion will be present, as there is interference with the pulmonary circulation and a forcing back of the blood.

Broncho-Pneumonia

Definition.—An acute inflammation of the mucous membrane lining the terminal bronchial tubes and their communicating air cells, with consolidation of the cells affected.

This is also known as **bilateral pneumonia, suffocative catarrh, catarrhal pneumonia, capillary bronchitis, and lobular pneumonia.**

Etiology.—Third dorsal vertebra subluxation in combination with C. P. and K. P.

Pathology.—This begins with a capillary bronchitis, in which the mucous membrane lining the terminal bronchioles becomes hyperæmic and swollen. This extends to the alveoli and air cells with which the bronchioles communicate, which is followed by exudation, so that there are soon noticed multiple areas of consolidation over both lungs. This exudate is more or less purulent in character, and consists of mucus, desquamated epithelium and leucocytes. It may be mixed with blood, which slowly oozes from the dilated capillaries, giving to it a reddish color. During this stage of consolidation, if a section of the lung be placed in water it will sink. Occasionally some of the larger bronchi are affected, and may be obstructed so that areas of collapsed lung can be found under auscultation. Resolution is by lysis, during which time the exudate or consolidated matter is slowly absorbed and eliminated from the body.

Symptoms.—The onset may be gradual, with pleurisy pains around the region of the nipple, axilla or scapula; with short, jerky respirations and a gradual rise in the bodily tem-

perature. Other cases may begin more abruptly, with a chill and rapid rise in the temperature. The fever reaches 102 to 104 degrees, and is of the remittent type. The pulse is rapid, the breathing is rapid, shallow and jerky, and there is slight cyanosis. The respiratory movement is vertical, as the respiration is of the superior costal type, and all accessory muscles of respiration are brought into play.

There is respiratory retraction of the lower sternum and ribs, and marked tenderness over both lungs, which is traceable under the axilla and scapula to the 10th intervertebral foramen. The expirations are noisy and prolonged. Rales can be heard and are of the crepitant or subcrepitant type. Cough is frequent and is accompanied with a blood-stained viscid expectorate. The cough is very loose at first and the expectoration is abundant, but as the air cells become consolidated and incapable of containing air it lessens. A marked decrease in the cough and expectoration, with increased area of consolidation, is a grave sign, and most of such cases die. With increased consolidation there is carbon dioxide poisoning, which diminishes the pain and increases the metabolic break-down material, thus increasing the excretory material of the body and throwing more work upon the excretory apparatus. About 75 per cent of pneumonia found in children is broncho-pneumonia, and in those cases cerebral symptoms are marked, the most common being delirium, but there may be stupor and coma. The fever disappears by lysis, but under adjustments will terminate abruptly.

Mild or subacute cases may run a prolonged course, with mild symptoms, consisting principally of cough, which may be dry, little expectoration, malaise, anorexia, insomnia, rales, remittent fever and marked exhaustion.

Differential Symptoms.—Broncho-pneumonia differs from bronchitis, in that the fever of the latter is slight, the rales are large and of the mucous variety, the dyspnoea is less marked, areas of consolidation are absent and the expectoration is very profuse.

In lobar pneumonia the area of consolidation is circumscribed and unilateral, while in broncho-pneumonia the areas of consolidation are multiplied and scattered on both sides. Lobar pneumonia has a sudden onset, and terminates by crisis in less than two weeks.

Acute tuberculosis is distinguished by its irregular fever, the hectic flush, the tubercular diathesis, the character of the expectoration and microscopical examination of the same.

Chronic Interstitial Pneumonia

Definition.—A chronic inflammation of the interstitial connective tissue of the lung, bringing about its hardening and thickening. This is also known as cirrhosis of the lung and fibroid pneumonia.

Etiology.—This chronic inflammation is caused by a subluxation of Lu. P. and K. P.

Pathology.—The inflammation of the connective tissue produces a hyperæmia of its blood vessels, a swelling of the tissue, which becomes permanent because of the proliferation of the connective tissue cells adding to its bulk, a loss of its elasticity and a final stretching of the air cells.

Symptoms.—During the early stages the most pronounced symptom is cough, which is dry and irritated by dust, cold air, and upon exertion. Dyspnoea soon becomes prominent, as does expectoration. The expectoration is mucopurulent, and may be accompanied with hemoptysis. There is moderate loss of flesh. The bronchi frequently becomes dilated and large, moist or mucous rales can be heard. In the advanced stages there is retraction of the respiratory muscles of the affected side, and thus decreased expansion upon that side. The ribs on the affected side approximate each other, the shoulder drops and there is a curvature of the spine in the upper dorsal region. The concavity of the curvature is toward the affected side, while its convexity is toward the elevated shoulder of the unaffected side. The unaffected side is greatly increased in size, the intercostal spaces on this side

are wide and the ribs run more horizontally. There is usually a compensatory emphysema of the unaffected side. A patient suffering with chronic fibroid pneumonia may live many years.

Pneumonokoniosis

Definition.—A form of chronic interstitial pneumonia characterized by consolidation of the lung tissue, and a characteristic expectorate whose color is dependent upon inhaled dust.

Adjustment.—Lu. P. and K. P.

Pathology.—Same as chronic interstitial pneumonia. Expectorate is colored by dust from various materials, dependent upon the occupation of the patient.

Symptoms.—The symptoms are those of chronic bronchitis, with cough, labored breathing, deficient expansion on the affected side, deformity of the thorax, as in fibroid pneumonia, and profuse expectoration.

When affecting coal miners it is called **anthracosis**, and the sputa is black from the coal dust.

In stone cutters the sputa is laden with particles of stone or other minerals, which give to it a grayish color, and is called **chalicosis**, or grinder's rot.

In iron workers the sputa is of a reddish or rusty color, and is called **siderosis**.

In millers the expectoration is grayish or white from the dust or flour or grain, and is called **fibrosis**.

Pulmonary Atelectasis

Definition.—A condition in which there is nonexpansion or collapse of the lungs, or a portion of the lung.

Adjustment.—Lu. P.

Pathology.—This may be very variable, as any condition preventing the passage of air into the alveoli of the lung will produce atelectasis. Among these may be mentioned obstruction of the bronchi by consolidation; by pressure from with-

out, such as tumor of the mediastinum, aneurism of the thoracic aorta, or an effusion of serum, as in serofibrinous pleurisy, empyema or hydrothorax.

Symptoms.—If the area of collapse is small no appreciation of the condition may be known to the patient, nor will there be any signs found upon physical examination of the patient. If larger, there may be deficient expansion on the affected side, rales, weakened respiratory sounds, and rapid respiration. There may be muscular twitching, cold extremities and slight cyanosis. This is not a disease, but rather a symptom of many other incoordinations.

Emphysema

Definition.—A condition in which there is a dilatation of the air sacs of the lungs, characterized by enlargement and distention of the lungs and difficult breathing.

Adjustment.—Lu. P.

Pathology.—The theory of inspiration is that the stretching of the air cell wall is directly produced upon too forcible and prolonged inspiration; the theory in expiration being that it is immediately produced by forced expiration, as in bronchial asthma. But for either of these theories to be operative the lung structure must be in a weak condition. This weakness was formerly supposed to be congenital, but, since the development of Chiropractic, can be accounted for by the subluxation at lung place.

Most frequently the upper portion of the lungs are affected, and are of a pale red color with thin vesicular walls. The dilatation of the walls is so great in many cases that the interalveolar septa is torn and the capillaries destroyed, so the affected portion of the lung lacks normal blood supply and is dry. The resistance offered to the pulmonary circulation may be so great as to effect right ventricular hypertrophy.

Symptoms.—There are four forms commonly recognized—interstitial, atrophic, hypertrophic and compensatory.

The **interstitial form** is a condition in which the walls of the air cells are ruptured and the contained air escapes into the adjoining areolar tissue spaces. If the amount of escaped air is small the symptoms are not noticeable, but if large the air creeps along the course of the bronchi and trachea in the areolar spaces and forms a tumorous bulging, usually above the episternal notch. Upon palpation the tumor is easily compressible, and does not pit after removing the pressure. There are friction sounds. Subcutaneous emphysema is readily recognized from the softness of the bulging.

Atrophic Form.—In this form there is an atrophy of the cell wall and a coalescing of the sacs into large vesicles. This is also called small-lunged emphysema, because of the small capacity of the lungs for containing air. The intercostal spaces are narrow, the ribs slant very obliquely downward, and respiration is accomplished with great difficulty.

Hypertrophic Form.—This is the most common form of emphysema, and occurs more or less in all cases of asthma and other diseases in which respiration is difficult, the dyspnoea being prolonged. The onset is very gradual and may not be suspected until long after it is present. There is dyspnoea, which may be constant or only felt upon exertion, wheezing breathing sounds, cyanosis, labored expiration and cough. The pulse is weak, but, as a rule, not rapid. There may be hypertrophy of the right ventricle, with its associated symptoms and signs. There is the characteristic emphysematous chest, in which the anterior-posterior diameter exceeds the lateral diameter. The respiratory movement is vertical, the sterno-mastoids are hypertrophied from overuse, and the neck veins are prominent. There is retraction of the upper abdomen upon inspiration. Rales may be present, vocal fremitus is lessened and the expirations are prolonged.

Compensatory Emphysema.—This is always unilateral, and is an adaptative condition when there is deficient expansion of the opposite side. Therefore, this form usually is associated with some other affection. It is commonly found with

fibroid phthisis, unilateral interstitial pneumonia, or other conditions rendering one lung or a portion of one lung functionless. The symptoms of the hypertrophic form will supervene, except that they will be confined to one side.

Abscess of the Lung

Definition.—A condition in which there is an accumulation of pus in a cavity of the lung, surrounded by a pyogenic membrane.

Adjustment.—Lu. P., with C. P. and K. P.

Pathology.—The abscess may be single, or multiple abscesses may form over both lungs. Usually the former is the case. This most frequently is secondary, following lobar pneumonia in which resolution failed to occur, the consolidated area undergoing suppuration. The consolidated material not being absorbed and eliminated from the body through the kidneys, and subjected to excessive heat, soon undergoes decomposition. Adaptatively a membrane of cicatricial tissue is formed around the forming pus so as to prevent its spread through the system, thus producing pyemia. This encapsulating tissue is lined by a membrane called a pyogenic membrane. Later the pus may perforate this sheath and empty into the pleural cavity or into a bronchus and be expectorated.

Symptoms.—There may have been the symptoms of some primary disease preceding those of the lung abscess. Upon the formation of an abscess there is a chill, followed by a high and irregular fever, which is characteristic of all pus diseases. The fever falls by crisis, with profuse sweating, and returns irregularly. There is cough and expectoration of a greenish-yellow pus which has a very offensive odor and contains destroyed tissue. If the pus is absorbed into the circulation the symptoms of pyemia may supervene. There is deficient expansion on the affected side. Tenderness is localized in the region over the abscess, and may be traced backward to the tenth intervertebral foramen. If there is erosion of blood-vessel walls, hemoptysis will occur. The blood being

of a bright red color and not of acid reaction, which fact distinguishes it from hematemesis.

Gangrene of the Lung

Definition.—Mortification or decomposition of the lung tissue.

Adjustment.—Lu. P. in combination with C. P. and K. P.

Pathology.—The gangrene may be of two forms—dry and moist. Dry gangrene occurs when an artery is obstructed, while moist gangrene occurs upon the obstruction of a vein. This will affect the entire part of the lung supplied or drained by the obstructed vessel. At first the tissue becomes a dark red color from the stasis of the blood, the vessels become hyperemic, the interstitial tissue swells, and excessive heat produces decay.

Symptoms.—There is an irregular and moderate fever, with great prostration and a feeble pulse. The patient rapidly becomes emaciated and debilitated. There is cough and expectoration of a greenish putrid expectorate. The expectorate is very profuse, and when permitted to stand will settle or form into three layers. The upper layer consists of a greenish froth, beneath which is a brownish-green fluid, and in the bottom a thick, dark sediment.

Tumors of the Lung

Tumors of the lung are usually either carcinoma or sarcoma. The gumma of syphilis may occur, but is more rare than the two former. A carcinoma is a malignant epithelial tumor. A sarcoma is a malignant tumor consisting of connective tissue.

Adjustment.—Lu. P. in combination with K. P.

Pathology.—This would depend upon the form present. In either case there is a growth which gradually increases in size, and in which there is progressive decay. For histological characteristics and differences of each, see Carcinoma.

Symptoms.—The symptoms are variable, according to the

size, location and degree of malignancy of the growth. So long as the growth is small no noticeable symptoms are present, but as soon as it attains sufficient size, pressure symptoms will develop. There is a persistent irritative cough, which may be accompanied with the characteristic currant-jelly sputa. Pain is localized and tenderness is traceable to the spine at the point of impingement. Dyspnoea may arise from pressure upon the trachea or bronchi. Dysphagia from pressure upon the esophagus, aphonia or dysphonia from pressure upon the inferior laryngeal nerve, local edema of the face, neck or upper extremities from pressure upon the veins draining them, and displacement of the heart so that the apex beat may be changed to the right or left of the normal. Later the characteristic sweetish odor is present, pain is of the gnawing type, the patient becomes emaciated, and the cancerous cachexia develops. The affected side may be enlarged and immovable during respiration. The character of the respiration depends upon the location of the tumor; if located high in the thoracic cavity the breathing will be of the abdominal type, but if located low will be of the superior costal type. In the late stages, irregular fever with excessive prostration occurs. The mortality is high.

DISEASES OF THE PLEURA

Pleurisy in General

The pleura is a large serous sac, or serous membrane, which enfolds the lungs, and is reflected upon the walls of the thorax and superior surface of the diaphragm. It has two layers—the visceral layer, which surrounds the lungs, and a parietal layer, which is adherent to the thoracic wall. Pleurisy is an inflammation of the pleura. The pain of pleurisy is produced by the friction of the two inflamed surfaces during respiration. Pleurisy may be either acute, subacute, or chronic. There are three forms recognized—fibrinous, sero-fibrinous, and purulent or empyema.

Acute Fibrinous Pleurisy

Definition.—An inflammation or excessive heat of the pleura, with a slight adhesive exudate.

Etiology.—Pleurisy is caused by a subluxation of the third dorsal vertebra, which impinges the nerves having to do with the calorific function in the pleura, producing inflammation.

Pathology.—This form of pleurisy is also known as adhesive or dry pleurisy, and is characterized by hyperæmia of the pleural vessels, swelling of the pleura, and at first a dryness of its surface, during which time pain is extreme. Later a scanty exudation occurs. This exudate is rich in fibrin, as the name of the affection indicates, and is very adhesive, or sticky, remaining upon the part from which it exudes. Frequently adhesions form so as to minimize the pain in cases of prolonged duration. In this form the inflammation ceases at this point.

Nerve Tracing.—Tenderness is traceable from Lu. P. outward, under the axilla, becoming diffuse over the area affected.

Symptoms.—The onset is sudden, with stitch pains around the region of the nipple, axilla or scapula. This pain is greatly increased upon movement, deep breathing and cough, all of which are more or less suppressed by the patient. The respirations are irregular, short and jerky, and are usually of the superior costal type. There may be slight fever of 101 degrees. Friction sounds are audible upon auscultation. This can be differentiated from intercostal neuralgia, in that fever and friction sounds are absent, and that the pain is not increased upon movement.

Sero-Fibrinous Pleurisy

Definition.—An inflammation or excessive heat of the pleura, with an effusion of serum into the pleural cavity.

Etiology.—Lu. P. and K. P. subluxations.

Pathology.—Early there is swelling of the serous membrane, hyperæmia of its blood vessels and exudation from its surface. Later there is an effusion of serum into the pleural cavity and an accumulation of serum in the pleural tissue. The pleural tissue becomes thickened, and often adhesions form. From the adhesions the heart may be displaced, the lung unable to expand, or the diaphragm unable to descend. The effused serum compresses the lung and prevents its normal expansion.

Symptoms.—The onset is gradual, or it may follow an attack of acute fibrinous pleurisy. There are sharp stich pains in the side, which are aggravated by coughing, movement, and deep breathing. The respirations are rapid and shallow, 30 to 35 per minute. There is a slight dry, hacking cough, which is suppressed as much as possible by the patient because of the pain it produces.

As soon as the effusion occurs the pain is diminished, for the effused serum acts as a lubricant between the two inflamed layers of the pleura. There may be orthopnœa, dyspnœa is increased, and cyanosis is present. The patient lies on the affected side so as to permit increased expansion of the lung on the unaffected side. The cough becomes very distressing. The affected side is one or two degrees warmer than the other. There is bulging of the intercostal spaces, the chest remains large during expiration, and the heart may be displaced. If the effusion is large the pressure downward may be sufficient to displace the liver on the right side of the spleen on the left side. Upon percussion there is a dull note in place of the clear resonance of health.

During the stage of resorption the signs of the effusion gradually diminish as the serum is being absorbed. The apex beat returns to its normal position, the bulging of the intercostal space subsides, the breathing is deeper and slower, and the cough disappears. This stage may last several weeks, but under Chiropractic adjustments occurs with great rapidity.

Different Varieties.—Latent pleurisy is a mild type, in which few and moderate symptoms are present.

Diaphragmatic pleurisy is an inflammation of the pleura on the superior surface of the diaphragm, and is characterized by pain under or along the costal margin; abdominal muscles are fixed, attacks of dyspnœa, choking or smothering with anginal pains.

Interlobular pleurisy is a form in which the inflamed area lies between the lobes of the lung, and if extensive adhesions occur, and if there is a retention of serum, it may be called encysted pleurisy.

Tuberculous pleurisy occurs during the course of a pulmonary tuberculosis when the tubercles form on the pleura, the inflammation of the tubercle in the necrosis being sufficient to produce pain upon friction.

Differential Symptoms.—Pleurisy differs from pneumonia in that the latter has a high fever, rusty sputa, herpes labialis, and signs of consolidation. From hydrothorax, in that fever is absent, also pain and friction sounds upon respiration.

Purulent Pleurisy or Empyema

Definition.—An inflammation of the pleura in which there is suppuration and the formation of pus.

Adjustment.—Lu. P., C. P. and K. P.

Pathology.—Empyema passes through all the stages of acute and sero-fibrinous pleurisy, therefore consists of swelling of the pleura, hyperemia of its blood vessels, exudation from its surface and effusion into the pleural cavity. If the effusion remains in the cavity, not being absorbed, and the excessive heat is continued, the serum will undergo suppuration. The pus may be absorbed or perforate through the thoracic wall, forming a fistula. Adhesions frequently occur, producing retraction of the thoracic walls.

Symptoms.—This might be considered as the tertiary stage of pleurisy, therefore the symptoms of acute and sero-fibrinous pleurisy will precede those of empyema. As soon as

the effused serum undergoes suppuration and pus is being formed, the bodily temperature will be greatly increased. The fever is irregular in its course and of the intermittent type, alternating with periods of free sweating. Blood examination shows leucocytosis. The patient rapidly becomes emaciated, and there may be delirium and stupor. If the pus is absorbed and eliminated the symptoms subside, but should the kidneys be working improperly the symptoms of pyæmia will supervene. In many cases the pus perforates through the thoracic wall, forming a fistula, through which the pus is discharged; or there may be a perforation of the visceral layer of the pleura and the pus finds its way to the bronchi, from whence it is expectorated. Pleurisy may become chronic without the effusion becoming purulent, in which case the effusion may exist, without increase or decrease in size, for months. The physical signs and symptoms are the same as sero-fibrinous, except that they may be more moderate and fever is absent.

Chronic Dry Pleurisy

Definition.—A chronic dry inflammation of the pleura in which there are adhesions, because of the fibrin exudate which is not absorbed.

Adjustment.—Lu. P.

Symptoms.—There are dragging sensations with occasional stitch pain in the affected side, but the general health may be unimpaired for years. There may be a retraction of the thoracic wall if adhesions have occurred between the visceral and parietal layers of the pleura. The respiratory sounds are weakened. In marked cases there may be a shrinking of the affected side, displacement of the heart and curvature of the spine.

Hydrothorax

Definition.—Is an exudation of a non-suppurative fluid in the pleural cavity, is usually bilateral, and often occurs in connection with general dropsy.

Adjustment.—Local in upper dorsal with K. P., except when due to general dropsy, as occurs in nephritis, when K. P. alone is adjusted.

Pathology.—There are no marked structural changes occurring, but there is a gradual oozing of serum or other fluid into the pleural cavity, which compresses the lung so as to prevent normal expansion. The adjacent tissues are edematous.

Symptoms.—Bulging of the intercostal spaces, pitting over the ribs, dyspnoea, relieved upon assuming the erect posture, and cyanosis from improper oxygenation of the blood. The pressure symptoms are the same as in pleurisy with effusion. It is distinguished from pleurisy by the absence of fever, bilateral character, absence of pain, and the history of the condition of which it may be a symptom, as in the case of nephritis.

Pneumothorax

Definition.—An accumulation of air in the pleural cavity, and is rarely a simple disease, but is usually associated with fluid or pus, in which case it is called hydropneumothorax, or pyopneumothorax.

Adjustment.—Lu. P. If pyopneumothorax, K. P. should be adjusted.

Pathology.—The gases that are usually found are oxygen, carbon dioxide and nitrogen, either in the free state or combined in various proportions. If the quantity is large and fills the cavity it will compress the lung and hinder respiration.

Symptoms.—This condition usually is associated with tubercular pleurisy, which perforates the pleura, or with empyema, therefore the symptoms of the associated condition may coexist. The onset is abrupt, with sudden pain in the side, intense dyspnoea and cyanosis. The pulse is frequent and weak, the pleural cavity becomes distended, the heart and abdominal viscera may be displaced from the pressure, and the intercostal spaces are widened, so that the chest wall ap-

pears smooth. Vocal fremitus is diminished or absent, and the voice sounds have a ringing note. There is the history of a perforating wound or of a malignant perforating disease, such as tuberculosis, abscess or gangrene of the lung.

Cancer of the Pleura

This may be either carcinoma or sarcoma, and may be single or multiple.

Adjustment.—Lu P., K. P.

Pathology.—An excessive accumulation of cells in which there is colloid degeneration. Sometimes defined as a riotous growth, which consumes the nourishment of the surrounding tissue.

Symptoms.—So long as the growth is small and the decay is slight no symptoms may arise. Later there are localized pains, cough, expectoration of the currant-jelly character, and dyspnoea. The sputa has an offensive odor, and consists of mucus, pus, destroyed tissue and colloid material, which is the product of cancerous degeneration. Dysphagia results from pressure upon the esophagus, and aphonia from pressure upon the inferior laryngeal nerve. There may be distension of the face and neck veins from pressure upon the superior vena cava or other large veins draining the upper extremities. Edema of the face, neck and upper extremities may occur from the same cause. The affected side is enlarged and the heart may be displaced. The cervical glands may be enlarged and hard, cancerous cachexia develops, the patient becomes emaciated, and pyopneumothorax may occur.

SECTION 10

**DISEASES OF THE CIRCULATORY
SYSTEM**

The Pericardium

The pericardium is a large sero-membranous sac surrounding the heart and the trunks of the large blood vessels which lead into and from it. It has two layers, the visceral and parietal. The visceral layer being the one reflected upon the myocardium.

Pericarditis is an inflammation of the pericardium, and is frequently associated with diseases of the lung and pleura, for the reason that an interference with the work of one also interferes with the work of the other, because they work in close conjunction one with the other, and, also, they are in adjacent zones, hence may be affected by the same vertebral subluxation.

Acute Fibrinous Pericarditis

Definition.—An excessive heat or inflammation of the pericardium in which there are frequently adhesions and a slight fibrinous exudation from its surface.

Adjustment.—H. P.; also C. P. and K. P., if fever exists.

Pathology.—The hyperemic stage is marked by a congestion of the visceral layer, giving it a dark red color and a swollen appearance. Within a few days there is an exudation from its surface which is deficient in serum and rich in fibrin, is of a very sticky consistency, and has a great tendency to form adhesions. The inflammatory process may affect the entire pericardium, in which case it is spoken of as being diffused pericarditis, or it may be limited to a part of either layer, and spoken of as circumscribed.

Nerve Tracing.—Tenderness can be traced from the ninth intervertebral foramen outward, under or over the scapula and under the axilla, becoming diffuse over the region of the pericardium. In unusual cases the tenderness may lead over the shoulder, passing beneath the clavicle to the region of the pericardium.

Symptoms.—Usually begins with chilliness or possibly a severe chill, which is followed by a rapid rise in the bodily temperature. The fever is slight, and is of the remittent or may be of the intermittent type. There is a sense of constriction in the chest, with substernal discomfort and a pain in the pericardium. There may be palpitation of the heart, a weak, irregular and often rapid pulse, with shooting pains in the region of the heart, simulating angina. The respirations are hurried and shallow, resembling those of pleurisy. Upon auscultation, friction or vibrating sounds are audible. In thin individuals there may be a bulging of the chest over the region of the pericardium. Adhesions may occur between the visceral and parietal layers, so that the heart's action is greatly interfered with and the apex beat may be displaced to one side, depending upon the nature of the adhesion. Sometimes adhesions will form between the parietal layer and the diaphragm and hinder respiration, in that it prevents the normal descent of the diaphragm.

Sero-Fibrinous Pericarditis

Definition.—An inflammation of the pericardium in which there is an effusion of serum.

Adjustment.—H. P. and K. P.

Pathology.—This begins, as does the acute fibrinous form, with hyperemia and swelling of the serous membrane; the velocity of the blood in the pericardial capillaries is lessened and an exudation occurs from its surface. Later there is an effusion of serum poured out from the serous membrane, which may vary greatly in quantity from a few ounces to one or two pints. The serum is deficient of fibrin, therefore adhesions do

not so frequently form as in the acute fibrinous form. The effused serum more or less compresses the heart and lungs, so that the heart's action and respiration may be interfered with to a marked degree. The vertebral subluxation interferes with the calorific function, thereby producing the excessive heat.

Symptoms.—The onset may be gradual, with substernal discomfort and stitch pains in the region of the heart. The pain and feeling of discomfort is aggravated by exertion and pressure. The respiration and heart action is accelerated, cyanosis and orthopnœa are present, and there may be a slight fever. With the effusion of serum the pain subsides, but the discomfort of the chest, sense of suffocation and pressure is increased. The face may become deeply cyanotic, and has an anxious expression. At this stage orthopnœa is more pronounced, breathing is more labored; palpitation, weak, irregular pulse and irregular fever are present. The variations of these symptoms depend upon the amount of effusion. If the absorption does not take place soon the pericardial sac becomes stretched or dilated, the effused serum may suppurate, and purulent pericarditis will result. In most cases there is insomnia, fainting and frequently delirium, when the fever is high. The anterior and lateral walls of the chest are enlarged, the intercostal spaces are prominent, the apex beat may become imperceptible, and there is great asthenia.

Purulent Pericarditis

Definition.—Is an inflammation of the pericardium in which there is the formation of pus. Also known as empyema of the pericardium.

Adjustment.—H. P., C. P. and K. P.

Pathology.—This form of pericarditis passes through the two former stages, viz.: Acute fibrinous and sero-fibrinous, in which there is swelling of the pericardium, congestion of its blood vessels, exudation from its surface, and effusion of serum into the pericardial sac. If this serum is retained here

for a great length of time and the excessive heat is prolonged it will be transformed into pus. Adhesions may also occur.

Symptoms.—Earlier signs and symptoms are those of a sero-fibrinous type, and followed by irregular chills, fever and sweats. May perforate into the pleural cavity.

Hemorrhagic Pericarditis

Definition.—An inflammation of the pericardium in which there is a hemorrhage or extravasation of blood into the sac during the course of the inflammation.

Adjustment.—H. P. alone for the hemorrhage. The rest of the adjustment depends upon the form of pericarditis with which the hemorrhage is associated. See two preceding forms.

Pathology.—The effusion of blood may occur in any form, but most commonly found in purulent pericarditis when there is perforation. In such cases the wall of the vessel may have been destroyed by ulceration. The hemorrhage may occur from a relaxation and separation of the muscular fibres forming the vessel walls, which permits a small gradual oozing of the blood. It may occur from the rupture of an aneurism of the aorta.

Symptoms.—These depend upon the extent of the hemorrhage and the condition with which the hemorrhage may be associated. If the oozing of blood is slight, no symptoms other than those of simple or sero-fibrinous pericarditis may exist. If, however, the hemorrhage should be large, there is severe dyspnœa, signs of effusion, localized pain in the region of the heart, a sudden drop in the temperature, anxious expression of the face, cold perspiration on the skin, feeble action of the heart, rapid and feeble respiration, and sudden death.

Chronic Adhesive Pericarditis

Definition.—A condition or form of pericarditis, chronic in nature, in which there is an adhering of the layers of the

pericardium or of the pericardium to the pleura. It is usually a sequel of the acute fibrinous form.

Adjustment.—Same as acute pericarditis.

Symptoms.—The symptoms of an acute attack always precede. There is a bulging of the chest over the heart, and inspiratory pain. If the adhesions exist between the pericardium and pleura there is a circumscribed retraction of the intercostal muscles at the point of the adhesion. Very frequently there is adhesion to the diaphragm, in which case it cannot be lowered to the full extent; this produces painful breathing, most marked upon inspiration. Apex beat is displaced and the heart's action may be interfered with so that the signs of hypertrophy may develop.

DISEASES OF THE HEART

Acute Endocarditis

Definition.—Is an excessive heat or inflammation of the inner lining of the heart.

Etiology.—Subluxation of the second dorsal vertebra and K. P.

Pathology.—The first stage consists of a swelling of the lining endothelium and a hyperæmia of its capillaries, giving to it a dark red color. This is especially marked upon the valve segments, because of their delicate structure. As the exudation occurs, a thickening and roughening of the membrane is produced by a proliferation of the connective tissue in the adventitia. This more or less interferes with the action of the valves, and the symptoms of valvular trouble may arise. If any of the formations should break off or become detached and carried by the blood stream, they are known as emboli, and may produce embolism.

Nerve Tracing.—Since this condition is produced by a second dorsal subluxation, tenderness will be found leading outward from the ninth intervertebral foramen, and is traceable beneath the axilla, becoming diffuse over the region of the heart.

Symptoms.—If the condition is slight, or in the early stage, the symptoms may be latent or very moderate, consisting of precordial pain, irregular pulse, slight fever, dyspnoea and a soft, low-pitched murmur over the aortic or mitral area, depending upon the valve or valves affected. If the condition is more severe, or if ulcerative endocarditis exists, there is a sudden chill, followed by a rapid and high rise in the bodily temperature. The fever takes an irregular course, having many remissions or intermissions, which is typical of suppurative fever. The precordial pain is marked, as is the dyspnoea and thoracic oppression. During the paroxysms of fever there may be delirium, stupor and coma. There may be murmurs corresponding to the valves affected, as the valves may contain ulcerations which permanently deform them. Sloughing of the ulcerated valve segments give rise to emboli. The spleen is enlarged, albuminuria may be present, the leucocytes are increased in number, sordes accumulate upon the teeth, and the symptoms of the typhoid status may supervene.

The termination depends upon the severity of the case. If moderate, the condition usually merges into chronic endocarditis, with valvular disease of the heart; if the ulcerative process is marked there may be toxemic jaundice and death occurring suddenly, the duration rarely exceeding eight weeks.

Should the case fall into the hands of the Chiropractor early in the course of the affection, the inflammation will subside, normal function being restored to the parts involved, and recovery will be rapid.

Chronic Endocarditis

A continuation or prolongation of the acute form, in which there is deformity of the valve segments, with regurgitation or stenosis.

Adjustment.—Same as the acute form.

Pathology.—See acute endocarditis.

Symptoms.—Since in chronic endocarditis there is a deformity of the valve segments so that they are incapable of properly guarding their orifice, there is regurgitation, and the symptoms will depend upon which valve is thus affected. Should there be adhesions of the valve segments so that the orifice is constricted and interference is offered to the flow of blood, the condition will be known as stenosis, and the symptoms will depend upon the valve thus obstructed.

In order to overcome the impaired function of the valves and to maintain the circulation as nearly normal as possible, the heart increases in size and strength. This is an adaptative enlargement and is commonly spoken of as a compensatory hypertrophy. The period during which this compensatory hypertrophy exists is called the period of compensation. Should the heart muscle lose its elasticity and dilate, thus becoming unable to maintain proper circulation, it is said that compensation is lost or there is ruptured compensation.

When compensation is lost there is marked dyspnoea, cyanosis, dropsy beginning in the feet, feeble and rapid pulse, pallor of the skin, congestion of the viscera, and general disturbed metabolism. The patient rapidly fails in health and soon dies.

Aortic Incompetency

Definition.—An abnormal condition of the left semilunar valve in which it is impossible to properly close the orifice during the diastole or dilatation of the heart.

Adjustment.—H. P.

Pathology.—If this results from acute or ulcerative endocarditis there may be either a deformity or a laceration of the valve segments, or an adhesion of the segment to the wall of the aorta. There may be a relaxation of the circular fibres surrounding the orifice, making it so large that the valve, though being normal, is incapable of properly closing the opening during the diastole. On account of the aortic valve

failing to properly close at the proper time, the blood is permitted to flow back from the aorta into the left ventricle, and the normal flow of blood from the left auricle continuing, causes an overfilling of the ventricle, which results in a stretching of the ventricular walls and a dilatation of the cavity. The extra effort of the ventricle to empty itself of this large supply of blood results in the adaptative hypertrophy of its walls.

Symptoms.—So long as the hypertrophy is maintained and compensates for the regurgitation, the patient will not suffer any marked symptoms. The pulse is strong, slow and steady, the face is ruddy, the circulation in the arteries is accelerated, the individual is strong, active and ambitious, and requires little sleep. If the hypertrophy should exceed that required for compensation to the regurgitation, there will be pulsation of the capillaries freely noticeable beneath the finger nails, the characteristic water-hammer pulse (Corrigan's pulse), headache, insomnia, tinnitus, congestion of the face and eyes, vertigo, syncope, cough, and sometimes hemoptysis.

As soon as compensation weakens there is palpitation, with attacks of angina pectoris, which causes great anxiety upon the part of the patient. Dyspnoea, cough and cyanosis are markedly increased, and there is engorgement of the viscera. The signs of venous stasis appear, with dropsy, beginning in the feet and gradually extending upward. The liver becomes enlarged, the kidneys become congested, the urine is diminished in quantity and contains albumen. Death occurs suddenly in this disease, more frequently than in any other form of valvular trouble.

Physical Signs.—Upon palpation, the apex is found to be displaced downward and to the left, often as low as the eighth intercostal space, and to the left of the mammillary line. Upon percussion, the area of cardiac dullness is increased vertically and to the left, and, upon auscultation, a soft, low-pitched, blowing murmur can be heard over the

aortic area, at the second right costal cartilage. Inspection may show a bulging of the chest.

Aortic Stenosis

Definition.—A constriction of the aortic orifice which prevents the normal flow of blood from the heart into the aorta.

Adjustment.—H. P.

Pathology.—Aortic stenosis may result from a contraction of the circular muscular fibres surrounding the aortic orifice, or from a thickening of the valve segments, making them nonflexible and unevenly shaped, or there may be a calcareous deposit upon the segments so that they project inward and cannot be pressed back by the blood. Stenosis may result from adhesions of these segments, and the degree may vary greatly in different cases.

Symptoms.—The lumen of the aortic opening being diminished, the amount of blood passing through during the normal systole will be lessened, but to compensate for this the systole is prolonged, and the diastole shortened. The pulse is characteristic, and is known as *pulsus parvus*. The systole is insufficient to entirely empty the left ventricle, and when the normal amount of blood is forced into it from the auricle the endocardial pressure is raised, which affects hypertrophy of the ventricular walls. The apex beat is displaced downward and to the left, the area of cardiac dullness is increased vertically and to the left, and a sharp, shrill, high-pitched systolic murmur can be heard at the aortic area. There are often attacks of vertigo, syncope, and palpitation upon the slightest exertion. Later, as compensation is lost, there is dilatation of the ventricular walls, and, possibly, the development of mitral insufficiency. The pulse then becomes rapid and weak; there are signs of venous stasis, Cheyne-Stokes respiration may appear and is a grave symptom, as but few patients with this type of respiration ever recover.

Mitral Incompetency

Definition.—A condition of the mitral valve in which it is unable to properly close the left auriculo-ventricular opening during the systole of the heart.

Adjustment.—The adjustment should be given at H. P.

Pathology.—As in other valvular troubles, there may be a great variety of pathological conditions present in mitral incompetency. This may be produced by a relaxation of the circular muscle fibres surrounding the orifice, thus rendering the valves too small to properly close the enlarged opening, permitting regurgitation. There may be deformities or adhesions of the valve segments, resulting from ulcerative endocarditis. There may be a calcareous deposit upon the valve, making its segments thick and nonflexible, or the cordæ tendinæ may be shortened, stiffened or permanently contracted. As a result of the regurgitation the left auricle hypertrophies, and when compensation ruptures, dilates.

Symptoms.—This is the most common form of valvular disease of the heart, sixty per cent of all valvular defects being of the mitral valve. So long as compensation is strong the symptoms are latent, and the signs of left auricular hypertrophy, with a soft, blowing systolic murmur in the mitral area, are the only indications of the trouble. As soon as compensation is lost there is dyspnœa and cyanosis upon exertion, attacks of palpitation and, possibly, orthopnœa; a distressing cough from the congestion of the lungs, which occurs because of the regurgitation into the pulmonary veins, preventing the proper oxygenation, and finally ventricular hypertrophy. So long as the left ventricle does not hypertrophy the apex beat is in the normal position, and the area of cardiac dullness will be increased only to the left and superior, but as soon as the left ventricle does enlarge the apex beat will be displaced downward and to the left, and the area of cardiac dullness will be increased vertically and to the left. There may be an ineffectual systole, which is noticeable at the wrist; this is produced when the greater part of the blood in

the left ventricle regurgitates upon the ventricular contraction, the amount of blood being forced into the aorta being insufficient to cause the pulse wave. This gives rise to an intermittent pulse, but the intermissions may be far apart. Upon inspection it may be discovered that the chest wall over the heart is noticeably enlarged and that the area of cardiac impulse is increased. This is more noticeable in children and thin individuals. A soft, low-pitched, blowing murmur, systolic in time, can be heard in the mitral area, and when heard, is pathognomic of the trouble. As dilatation occurs the pulse becomes more feeble and rapid, dropsy appears in the lower extremities and gradually extends upward; pulmonary congestion becomes extreme, dyspnoea and cyanosis are marked, and the patient may become unable to move about or to lie in the dorsal posture. If the dropsical condition is severe the patient will have to constantly assume an erect position, and Cheyne-Stokes respiration may be present.

If the incompetency is due to a relaxation of the circular muscle fibres surrounding the mitral orifice, it is caused by a lack of motor power being expressed in these fibres, and if the subluxation is properly adjusted, the motor power will quickly be restored and the symptoms will disappear. If there is a deformity of the valve segments, it is the result of excessive heat because of pressure upon the calorific nerves; the adjustment will restore normal transmission of the calorific impulses, heat will then become normal, and the deformed or thickened valve will gradually assume its normal shape and structure. Numerous cases are on record in which complete restoration has been effected through Chiropractic adjustments.

Mitral Stenosis

Definition.—A condition in which there is a narrowing of the mitral orifice.

Adjustment.—Same as mitral incompetency.

Pathology.—There may be a contraction of the circular muscle fibres surrounding the mitral orifice, decreasing its size and preventing the normal flow of blood into the left ventricle.

There may be deformities and adhesions of the valve segments, which produce the "button-hole" valve. These deformities may be the result of excessive heat, in which there has been proliferation of the connective tissue of the valve or a deposit of calcareous material upon the free edges of the segments.

Symptoms.—This disease may be associated with mitral incompetency, and the symptoms vary with the degree of constriction. The most constant symptoms that appear early are dyspnoea and attacks of palpitation. The pulse is small, irregular and feeble. There is pulmonary congestion with its attending symptoms, especially cough and frothy expectoration. Hypertrophy aims to adaptatively compensate for the stenosis, and, as a result, the area of cardiac dullness is increased superiorly and to the left; a short, sharp, shrill, high-pitched murmur can be heard in the mitral area during the diastole of the ventricle. In order to increase the force of the pulmonary circulation and overcome the pulmonary congestion, the right ventricle becomes hypertrophied, and the signs of right ventricular hypertrophy may exist. The apex beat may be displaced to the left, but not much to the inferior. There may be a bulging of the lower sternum if the right ventricle is enlarged, and the fifth and sixth costal cartilages may also be prominent. With the loss of compensation there is nearly always the appearance of Cheyne-Stokes respiration, cyanosis, general weakness and emaciation, and finally death.

Tricuspid Incompetency .

Definition.—A valvular incoordination of the heart in which the tricuspid valve fails to properly guard the right auriculo-ventricular opening.

Adjustment.—Upper dorsal.

Pathology.—In the great majority of cases there is a stretching of the tricuspid orifice, thus making the valve segments insufficient to properly guard the opening. This dilatation may be adaptative to mitral incompetency, in which there is pulmonary congestion, and in which the right ventricle aims to overcome it by hypertrophy. Or this may occur as a part of the right ventricular dilatation. Less frequently it is the result of deformity of the valve segments or contraction of the cordæ tendinæ.

Symptoms.—There is regurgitation of the blood from the right ventricle into the right auricle during the systole of the ventricle, which increases the endocardial pressure of the auricle, and soon results in hypertrophy or dilatation of the auricle walls. Resistance is offered to the flow of blood from the pre and post cava, which is manifested in edema of both lower and upper extremities. There is pulsation of the jugular veins and of the liver, which can be felt upon palpation. The viscera becomes congested and the liver palpably enlarged. The signs of hypertrophy are marked upon the right side. The area of cardiac dullness is increased vertically and to the right, the apex beat may be normal or displaced slightly to the left, and auscultation reveals a soft, low-pitched, blowing murmur, systolic in time, over the tricuspid area. There is a marked prominence of the lower sternum in the young, and a noticeable pulsation to the right of the sternum. Pulsation may be noticeable over the upper epigastrium. This is a rare form of valvular trouble, and is considered as having the most unfavorable prognosis.

Tricuspid Stenosis

Definition.—Is a constriction or narrowing of the tricuspid orifice, diminishing its capacity for transmitting blood.

Adjustment.—Upper dorsal.

Pathology.—If the condition is a sequel of endocarditis, there is the same pathology as in mitral stenosis, viz.: the de-

formity, adhesion or calcareous deposits of the valves, which diminishes the size of the opening and prevents the normal flow of blood into the right ventricle. It may be produced by pressure upon the motor nerves leading to the part, causing an abnormal expression of this function, in which the circular fibres surrounding the opening are abnormally contracted, thus diminishing its lumen.

Symptoms.—The earlier subjective symptoms consist of attacks of palpitation, dyspnoea and cyanosis, which are increased upon exertion. There may be precordial pains, which usually are alarming to the patient. The resistance offered to the onward flow of blood is so great that venous stasis results, with dropsy and marked cyanosis. The right auricle adaptatively enlarges, therefore the area of cardiac dullness is increased to the superior and right; a short, sharp, shrill presystolic murmur can be detected upon auscultation over the tricuspid area. The apex beat may be but little displaced by the enlargement.

This is the rarest form of valvular disease of the heart, and when it does occur, is often associated with some other valvular defect, so the coexisting symptoms of mitral disease or right side dilatation should also be considered.

Pulmonary Incompetency

Definition.—An abnormal condition of the right semilunar valve, in which it is unable to properly guard the pulmonary orifice during the ventricular diastole.

Adjustment.—Upper dorsal vertebræ, usually the second.

Pathology.—This is also a very rare form of valvular trouble, but when it does exist the same condition as that found in aortic incompetency is present. There may be a dilatation of the muscular fibres surrounding the opening or deformities of the valve segments so that they fit imperfectly and permit the backward flow of blood.

Symptoms.—Upon the ventricular diastole the blood flows back from the pulmonary artery into the right ventricle, thus

diminishing the amount of oxygenation and producing cyanosis. This, with dyspnoea, palpitation and distention of the superficial veins, are the most constant early symptoms. In order to partially overcome this defect, the right ventricle hypertrophies, thus increasing the area of cardiac dullness to the right and downward.

Upon inspection the lower and right costal cartilages are pushed forward, and there is a large area of visible cardiac pulsation over the upper abdomen.

Auscultation reveals a low-pitched, blowing murmur over the pulmonary area at the second left interspace which is diastolic in time of occurrence.

Finally, as compensation is lost, there is marked venous stasis, dropsy, congested viscera, suffocative attacks and precordial distress.

Pulmonary Stenosis

Definition.—An abnormal condition of the pulmonary opening, which is constricted, presenting difficulty to the passage of blood from the right ventricle into the pulmonary artery.

Adjustment.—Second dorsal vertebra.

Pathology.—As in aortic stenosis, there may be a contraction of the circular muscle fibres surrounding the opening, or deformities or adhesions of the valve segments. This is a rare form of valvular disease, and sometimes is congenital.

Symptoms.—Hypertrophy compensates for the valvular defect in this incoordination, as in other forms of disease, and so long as the compensation is maintained the symptoms are slight. When lost, it gives rise to cough, dyspnoea, cyanosis, dropsy, and finally death. The right ventricle becomes hypertrophied so that the area of cardiac dullness is increased vertically and to the right. There may be a large area of visible pulsation to the right of the sternum and over the epigastrium.

Upon auscultation a sharp, shrill, high-pitched murmur

can be heard over the pulmonary area during the ventricular systole.

Finally, there is venous stasis, dropsy, pulmonary congestion, suffocating attacks. Cheyne-Stokes respiration, emaciation, and finally death.

Hypertrophy of the Heart

Definition.—An overgrowth or increase in the muscular tissue of the heart walls, characterized by forcible pulse, overfullness of the arteries, diminished blood in the veins, and accelerated circulation.

Hypertrophy may exist without dilatation, and when such is the case it is called simple hypertrophy. If the hypertrophy is associated with dilatation or increase in the size of the cavities, it is called eccentric hypertrophy. If in hypertrophy of the heart the cavities are diminished in size, it is called concentric hypertrophy. This latter form is usually a post mortem finding.

Adjustment.—Hypertrophy of the heart is an adaptative condition, therefore the adjustment should be given locally for the condition to which the hypertrophy is adaptative. This is usually at H. P., but may be elsewhere. Hypertrophy of the heart in athletes is common, and in those cases the adjustment is always H. P.

Pathology.—The hypertrophy may be general, affecting the walls of all the cavities, but usually it is limited to the wall of one or more cavities, and this most frequently on the left side. Most frequently this is adaptative to mitral incompetency and aortic incompetency. The left ventricle is more frequently enlarged than the left auricle, and eccentric hypertrophy is the form most commonly met with. There is a marked increase in the amount of the muscular tissue of the organ. It is of a more firm consistency and of a darker color. When the enlargement is confined to a single cavity the heart is greatly changed in shape, this change depending upon the cavity enlarged.

Symptoms.—Left ventricular hypertrophy may be adaptative to mitral incompetency, aortic stenosis or incompetence, aneurism of the aorta, and to arteriosclerosis, in which there is great peripheral resistance to the onward flow of blood. When a result of any of the foregoing conditions, the symptoms of each will be associated with that of the hypertrophy. The heart is enlarged, the apex beat is displaced downward and to the left, because of the added weight, the left side of the chest may bulge, and the area of visible pulsation is increased except when lying upon the back, when it may be diminished, as the heart drops back in the mediastinum.

The pulse is forcible, slow, noncompressible and regular, unless regurgitation is present to a marked degree. The skin is flushed, capillary pulsation may be seen beneath the finger nails, and murmurs are absent unless there are valvular defects.

Right Ventricular Hypertrophy.—This may be adaptative to mitral stenosis or incompetency, or any other condition which interferes with the flow of the blood from the right ventricle to and through the lungs, causing the heart to overwork. In this there is moderate dyspnœa, which is more marked upon exertion, precordial discomfort, cough and expectoration of frothy mucus, characteristic of pulmonary congestion, prominence of the lower sternum and pulsation to the right of the sternum.

Auricular Hypertrophy.—Hypertrophy of the left auricle wall is adaptative to mitral stenosis or incompetency. There is usually throbbing in the head, tinnitus aurium, headache, thoracic distress and the associated symptoms of mitral incoordination.

Right auricular hypertrophy is adaptative to tricuspid stenosis or incompetence, and is accompanied by edema, sub-oxidation of the tissues, dyspnœa, cyanosis and precordial discomfort. This is the rarest form of cardiac hypertrophy.

Dilatation of the Heart

Definition.—An abnormal condition of the heart in which the size of the cavities is increased out of proportion to the thickness of their walls, and is characterized by dyspnœa, cyanosis and feebleness of the circulation.

Adjustment.—H. P.

Pathology.—When compensation is lost in valvular diseases, the result is dilatation. In fact, the dilatation, which takes the place of hypertrophy, is the thing which brings about lost compensation. The muscular fibres relax, the heart is enlarged, the walls become thinner, but still may be thicker than normal, and the cavities are greatly enlarged. With the enlargement of the cavities the various valvular openings become larger, making the valves insufficient to properly guard them, and permit regurgitations; the result is engorgement of the organs of the body.

Symptoms.—The dilatation depends upon the weakness of the muscular fibres forming the heart walls and upon the increase in the endocardial pressure. There is a lack of motor function in the muscle of the heart which, with the added increase in endocardial pressure, results in its stretching.

Dilatation of the heart is manifested by dyspnœa upon exertion, cyanosis, precordial oppression, attacks of palpitation, tachycardia, and the pulse is also weak and easily compressible.

The apex beat is displaced and is weak, and the area of visible pulsation is small. The enlargement may be so great that pressure symptoms arise from pressure upon the lungs, esophagus and large vessels. Soon venous stasis, with dropsy, appears, and the termination is fatal.

Under adjustments the normal amount of motor impulses reach the heart, which, when expressed as function, give to the muscular fibres added strength and tonicity, so that it is equal to the work which it is called upon to do. When the cardiac muscles regain normal tonicity the heart returns to normal size, and all symptoms subside.

Fatty Heart

There are two varieties of fatty heart—fatty degeneration and fatty infiltration.

Fatty degeneration is an abnormal condition of the heart in which there is interference with the metabolism of the organ, and a conversion of its muscular tissue into an oily substance.

Pathology.—In fatty degeneration the muscular fibres of the heart walls undergo changes, the principal of which is the transformation of its muscular elements into fat and oil globules. This change may affect the entire organ or any one of its walls.

Adjustment.—H. P. and K. P.

Symptoms.—The action of the heart is slow, feeble and irregular. The pulse is easily compressible, there is dyspnoea upon slight exertion; localized anemia is common, on account of the inability of the heart to properly force the blood through the arteries and maintain normal circulation. Cheyne-Stokes respiration is common, cardiac asthma, angina pectoris, palpitation and finally the signs of dilatation occur because of the loss of muscular elasticity by the degenerative change that has taken place. There are symptoms of general impaired nutrition, as is manifested by pallor of the skin, general weakness, emaciation and syncope from ischemia of the brain.

Fatty infiltration of the heart is a condition in which there is a deposit of fat upon the myocardium, or between the muscular fibres.

It is not considered pathological, as the fat is of normal consistency and is usually found in obesity.

Its symptoms consist of palpitation upon exertion or excitement, precordial bulging in the young, shortness of breath, feeble pulse, weakness of the cardiac muscle and a resulting dilatation. But few symptoms appear until dilatation occurs. The early symptoms are due to the enlarged heart working in close quarters, and are usually aggravated after eating a

hearty meal, in which case the diaphragm cannot be lowered, thus crowding the heart.

Acute Myocarditis

Definition.—This is also known as *carditis* and is an inflammation or excessive heat of the muscular tissues of the heart. The inflammation may be suppurative or nonsuppurative.

Adjustment.—H. P. should always be adjusted, and if of the suppurative type K. P. should be adjusted in combination.

Pathology.—In case the inflammation is simple the excessive heat results only in hyperemia of the cardiac vessels. swelling of the muscles and an infiltration of the serum into the muscle. If it should be suppurative, there is in addition to the above a suppuration or decomposition of the infiltrated serum, transforming it into pus, which may collect, forming an abscess, and this may rapidly be fatal, or may result in aneurism of the heart. If the pus is absorbed from the abscess, scar tissue is formed.

Symptoms.—Acute myocarditis occurs with rare frequency as a primary condition, and if so the symptoms are of short duration. It most frequently is associated with pyemia, septicemia, or a severe case of typhoid. There is severe cardiac pain, which is continuous, a feeble pulse, which is also rapid and irregular, fever, which may be remittent or intermittent, cardiac asthma, and the signs of collapse, consisting of a rapid, feeble pulse at the onset of the collapse, anxious expression of the face, pallor of the skin, a marked drop in the temperature, cold perspiration on the skin, quick, shallow breathing, apex beat becomes imperceptible, finally the heart entirely fails and death is the result.

Chronic Myocarditis

Definition.—A slow, chronic inflammation of the cardiac muscle, in which there is a gradual thickening and hardening

of the heart walls, characterized by shortness of breath, precordial pain and disordered circulation.

Adjustment.—H. P.

Pathology.—The structural changes of chronic myocarditis may be limited to the walls of one cavity or the entire organ may be affected. There is an overgrowth of connective tissue and a growth of new fibrous tissue, which renders the muscle hard and inelastic. This hardening may extend to involve the valves, making them nonflexible, and resulting in valvular incompetency. Preceding the development of this fibrous hyperplasia there may be the pathological condition of acute, simple myocarditis, the acute merging into the chronic.

Symptoms.—During the earlier stages of the trouble few or no symptoms may be noticeable, but as soon as any extra effort is made upon the heart, there is short breath, palpitation, irregular pulse, attacks of angina and vertigo. The pulse rate may be decreased in frequency and there may be a sense of constriction in the chest. Syncope may occur suddenly without any premonitory symptoms. As the fibrous overgrowth increases the symptoms are intensified. Later there is progressive emaciation and debility, with disturbed digestion and function of all organs. Finally dilatation occurs, with its attending symptoms.

The Cardiac Neuroses

A neurosis is a functional disturbance without the existence of a pathological condition, or in which the pathology is not observable.

There are five cardiac neuroses—palpitation, bradycardia, tachycardia, angina pectoris and arrhythmia.

Palpitation is an irregular and fast beating of the heart, of which the individual is uncomfortably conscious.

Symptoms of Palpitation.—The onset is usually sudden, following some undue excitement or overexercise, or may occur suddenly without any premonitory excitement. It begins

with pain in the region of the heart and a fast, forcible beating, giving rise to a forcible impulse that can be seen through the clothes. There may be vertigo, flashes of light before the eyes, an expression of fear upon the face and a sense of impending danger or death. The patient has to assume the upright position to facilitate respiration. The duration of the attack may be from a few seconds to several hours, after which the patient is usually exhausted and sinks into a sleep. Palpitation frequently occurs as a symptom of some other effect, and is only considered as a neurosis when there is no accompanying pathological condition. It is caused by a subluxation at H. P., and, as a rule, yields very readily to adjustments. Several cases are on record that have recovered after a single adjustment at H. P. The palpitation is merely a manifestation of the inability of the heart to properly carry on its work, which is all caused by the H. P. subluxation impinging the nerves leading to the heart.

Tachycardia.—Is a neurosis of the heart, characterized by periodical fast beating of the heart. The heart's action must be increased to 150 beats per minute before it is considered tachycardia.

Adjustment.—H. P.

Symptoms.—In many cases there are no subjective symptoms, and the condition can only be recognized by a count of the pulse. If its rate exceeds 150 beats per minute, the name tachycardia is applied.

Some cases have premonitory symptoms of dizziness, tinnitus or fear of impending danger, followed by a fast beating of the heart, with pulsation of the carotids, pallor of the face, which soon becomes flushed, and slight increase in the respiratory rate. Dyspnoea is rarely a symptom, though there may be a sense of constriction in the chest. The duration may be short, lasting only a few minutes, or it may endure for several days with periods of partial rest. The pulse is small, rapid, weak and easily compressible.

Bradycardia.—A neurosis of the heart in which its action is periodically or permanently slowed. Bradycardia begins when the heart's action is reduced to forty beats per minute.

Adjustment.—H. P.

Symptoms.—This is a frequent symptom of chronic myocarditis and fatty heart, and in such cases is considered as a symptom and not a neurosis. The pulse is weak, small and slow. As a result of this slow action there may be attacks of fainting from cerebral ischemia, noises in the head, dizziness, and sometimes convulsions. The pulse rate may vary from 40 to 80 beats per minute. Often terminates in sudden death.

Arrhythmia.—This is an irregularity of the heart's pulsations, or a lack of cardiac rhythm.

Adjustment.—H. P.

Symptoms.—This is but rarely a neurosis, but usually a symptom of some valvular defect when compensation is lost. It is characterized by an irregular or an intermittent pulse. When irregular it may be a symptom of palpitation of the heart, dilatation of the left ventricle, or aortic disease. When intermittent it is always a sign of ineffectual systole of the left ventricle, as is commonly present in severe cases of mitral incompetency when compensation is being or is lost. It can be determined only by taking the pulse.

Angina Pectoris.—A paroxysmal severe pain of sudden onset, occurring in the region of the heart and radiating down into the left arm and left side of the neck.

Adjustment.—H. P.

Symptoms.—Angina pectoris may have a pathological condition, and when so it consists of sclerosis of the coronary arteries, which prevents the blood supply to the heart muscle. This is caused by an H. P. subluxation impinging the nerves leading to the arteries of the heart. This begins suddenly without any prodromal symptoms. A severe pain begins in the region of the heart, which is agonizing to the patient, and radiates in a circular manner upward along the left side of the neck and downward into the left arm and hand. During

the paroxysm of pain the respiratory muscles are fixed, the face becomes cyanosed and has an anxious expression, and the patient fears impending death, which frequently occurs suddenly.

Cases that survive are extremely depressed and prostrated from the attack, which is usually of but a few seconds' duration. There may be voiding of large quantities of pale urine, and the patient may express a feeling of coldness. Future attacks may occur, and usually do in cases where there is any sclerosis of the coronary arteries, should the patient survive the first attack. Adjustment at H. P. would restore the condition to normal, thus preventing subsequent and possibly fatal recurrences.

DISEASES OF THE ARTERIES

Arteriosclerosis

Definition.—Is a chronic inflammatory depletion of the vascular system, in which there is a thickening and hardening of the vessel walls and sometimes followed by a calcareous deposit. It is properly termed arteriosclerosis when the arteries alone are affected. When the veins are affected by the depletion it is called phlebosclerosis; when the arteries and capillaries are affected it is called arteriocardillary fibrosis, and when all the vessels are affected it is properly termed angiosclerosis.

Adjustment.—This depends largely upon whether the sclerosis is general or localized in the arteries of one organ, in which event the adjustment will be local to that organ. In all cases K. P. should be adjusted.

Pathology.—The change in the vessel wall is inflammatory in character and begins with a hyperaemia of the vasa vasorum; this is followed by an irregular thickening of the intima, due to proliferation of the connective tissue. There may be calcification of the vessel walls, rendering it a stiff, hard tube, void of elasticity, thus hindering the propulsion

of the blood current and raising the arterial pressure. The intima is often increased to four times its normal thickness, and with the great unevenness of the thickening may obliterate the lumen of the vessel, producing a condition of thrombosis.

Symptoms.—The condition may be limited to a single vessel and the symptoms are more marked in that part. The aorta is most frequently the site of arteriosclerosis, but the splenic, femoral and coronary arteries are also frequently affected. There are frequent attacks of vertigo or dizziness when the vessels leading to the brain are affected. If the superficial arteries are affected they feel hard or bony upon palpation, and are sometimes called the "whip cord" arteries. The pulse is slow and is known as the *pulsus tardus*. The blood pressure is high because of the increase in the peripheral resistance to the onward flow of blood; this throws greater strain upon the walls of the left ventricle, and in time effects its hypertrophy with its attending symptoms.

There may be thoracic oppression, dyspnoea upon exertion, angina pectoris, frequently vertigo and fainting spells, and later the indications of dilatation.

Arteriosclerosis is frequently associated with alcoholism and syphilis, and is explained as follows: In every case of syphilis there is thickening and hardening of the connective tissue of the organ, in which it becomes localized; in other words, syphilis is a proliferation of connective tissue. This occurs when it becomes localized in the spinal cord, as in locomotor ataxia, as in the brain in dementia paralytica, in the liver in cirrhosis, etc. So when syphilis becomes localized in the arteries the condition produced is the same as in arteriosclerosis and may be so named.

Alcohol will harden tissue, as can be plainly seen in pouring some over the white of an egg and letting stand for a time. If alcohol is constantly taken into the system, and the excretory system is not working at the maximum, a part of the alcohol remains in the circulations of the body. The

greater part of the fluid of the body passes through the blood vessels; hence the tunica intima of the vessels is constantly being bathed in this fluid containing alcohol, and its prolonged effect is such as to produce the hardening known as arteriosclerosis. However, should the proper adjustment be made at K. P., whereby the elimination of the impurities will be increased, the alcohol will be eliminated before it could have this derogative effect upon the delicate tissues. Arteriosclerosis does exist without either alcoholism or syphilis, and has been entirely obliterated by adjustments.

Aneurism

A True Aneurism is a localized or circumscribed dilatation of an artery, the sac thus formed consisting of one or more layers of the vessel wall.

A Dissecting Aneurism is one in which the tunica intima is ruptured and the blood forces itself between the layers of the vessel wall.

An Arterio-Venous Aneurism is an abnormal communication between an artery and a vein.

Aneurism most frequently affects the aorta, and may affect the ascending arch, the thoracic or the abdominal aorta.

Adjustment.—This will be local, depending upon the location of the dilatation. If of the arch, the adjustment will be H. P.

Pathology.—Because of the lack of motor function expressed in the muscular fibres of the artery wall, they become relaxed and stretched and the vessel becomes dilated. The dilatation may be cylindrical, fusiform or sacculated in shape. The size of the dilated sac may vary greatly from that of a walnut to the size of an orange, or even larger.

Symptoms.—**Thoracic Aorta.**—The symptoms depend upon the size and position of the aneurismal tumor. So long as it is small and does not press upon other organs no symptoms will appear, but as soon as it attains sufficient size to

produce pressure symptoms there will be pain, which is localized at the point of the aneurism, and may be of a circling character; dyspnœa may be produced from pressure upon the trachea or bronchi, dysphagia from pressure upon the esophagus, and aphonia from pressure upon the inferior laryngeal nerve. There may be cough, rapid respiration, deficient expansion of the lungs and the heart may be displaced. Thoracic aneurism most frequently affects the ascending arch, and when large may affect the aortic valve, producing incompetency, as the orifice may be involved in the dilatation.

Abdominal Aorta.—There is pain corresponding to the location of the aneurism, which is increased upon exertion. The pressure retards the force of the pulse in the femoral artery, and pressure upon abdominal viscera will produce symptoms referable to those organs. There may be a large area of visible pulsation, especially in thin individuals, and upon visceral palpation a pulsating tumor can be felt. The heart's action is irregular, the general health is impaired and death may occur suddenly from rupture of the stretched wall. When rupture occurs the blood forces itself between the minute muscular fibres because of their extreme relaxation, due to lack of motor impulses from the brain, giving it tonicity. The adjustment permits the normal flow of motor impulses to the muscular fibres, giving them elasticity and tonicity, so that the dilatation gradually diminishes until normal elasticity is established.

SECTION 2

DISEASES OF THE BLOOD AND DUCTLESS GLANDS

Anemia

Definition.—A condition in which there is a lack of red corpuscles, or a lack of hæmoglobin in the red corpuscles, or where there is a disproportionate amount of serum to the quantity of hæmoglobin and corpuscles, or it may be a reduction in the total amount of the blood. It may be defined as an abnormal quantity or quality of the blood.

Etiology.—Anemia may be primary or secondary. Primary anemia is always the result of depraved nutrition, which is caused by subluxations affecting the various digestive organs, or at K. P. It may be that the liver, stomach, pancreas or intestines are improperly digesting the food, so that it is not in a state that it can be utilized by the body, or cannot be assimilated. It may be that the excretory apparatus is acting improperly, the metabolistic poisons are not being eliminated but are being retained, and when present in the body prevent normal metabolism and growth. Therefore, in primary anemia the adjustment may be K. P. with Li. P., S. P., L. S. P., or lumbar.

Secondary anemia is the result of a condition which deprives the blood of any of its ingredients or diminishes its amount in the body.

Adjustment, if secondary, will depend upon the condition to which it is secondary.

Symptoms of Secondary Anemia.—History of condition to which anemia is secondary—paleness of the skin, weakness and possibly vertigo and syncope. This may be the result of a profuse hemorrhage, in which the total amount of blood

in the body is greatly lessened, or it may be the result of some ulcerative condition in which pus and toxins are being absorbed into the circulation. Secondary anemia may be the result of cancer or syphilis, and in such cases is spoken of as cancerous cachexia or syphilitic cachexia. In either of the latter there is disintegration of the red cells and malnutrition of the entire body.

Primary Anemia

There are two varieties of primary anemia, chlorosis or chloro-anemia and progressive pernicious anemia.

Chlorosis or Chloro-Anemia

Definition.—A form of primary anemia in which there is a marked decrease in the amount of hæmoglobin in the red cells of blood. It is also called the green sickness.

Pathology.—Chlorosis is usually met with in girls about the age of puberty and is often associated with amenorrhea. The amount of the hæmoglobin in the red cells is greatly diminished, often to twenty per cent of the normal, rendering the skin pale. The red cells are about normal in number, as are the white ones.

Symptoms.—The symptoms of chlorosis usually develop very slowly and are often first noticeable when there is some menstrual disturbance, such as menorrhagia or amenorrhea. It will be noticed that there is a change in the disposition of the girl; those who have been previously quiet, sensible and jolly now become melancholic, despondent and fretful. The complexion becomes pale, noticeable in the blonds as the skin becomes pale, waxy and puffy, without any edematous swelling. The brunettes assume a dark, muddy color and have dark circles around their eyes. As a rule the patient does not become emaciated, but in rare cases the emaciation is extreme. There are weakness and fatigue, rapid respiration, nearly always constipation, cold hands and feet, and a rapid

and feeble pulse. Blood examination shows a decrease in the amount of hæmoglobin, which makes the blood paler than normal.

Progressive Pernicious Anemia

Definition.—A malignant form of primary anemia, progressive in its course, characterized by a decrease in the number of erythrocytes and a terminal fever.

Adjustment.—See Anemia.

Pathology.—The number of red blood cells is markedly decreased in number, sometimes being as low as 500,000 per cubic millimeter, while the normal count is about 4,500,000.

This gives to the blood a pale color, although the hæmoglobin may be relatively increased. The blood coagulates very slowly and imperfectly. There is no increase in the number of white cells. Various pathological forms of cells may appear upon microscopic examination. The most common of these are normoblasts, microblasts, megaloblasts, microcytes and megalocytes. Of these the megaloblasts are a grave indication, while if macroblasts are found it is a good indication. Macroblasts indicate recovery, or indicate that there is constructive metabolism going on within the body.

Symptoms.—The onset is insidious with fatigue and languor, which increases and becomes extreme. The countenance becomes pale and the whites of the eyes pearly. Respiration is frequent and dyspnœa occurs upon slight exertion. Weakness becomes extreme so that the patient is unable to continue his occupation, still suffers no pain or other discomfort. The general frame becomes bulky rather than emaciated, but this is not normal flesh. There are anorexia, nausea and spells of vomiting. Diarrhœa may be a symptom. The blood coagulates slowly and there may be small petechial hemorrhages scattered over the skin. Menstruation may cease so as to conserve the limited supply of red blood cells. The mucous membranes of the mouth are pale and bloodless, the tongue is pale, the muscles become flabby, fever appears and the men-

tality becomes impaired. The analysis depends upon the microscopical examination of the blood.

Leukemia

Definition.—An abnormal condition of the blood in which there is a great increase in the number of white blood corpuscles, enlargement of the spleen, lymphatic glands and sometimes the bone marrow.

Adjustment.—This is an abnormal expression of the function of nutrition, and may be caused by the same subluxations as in anemia, viz.: Li. P., S. P., K. P., and lumbar.

Pathology.—First, the blood is paler than normal, there is a great increase in its leucocytes and its specific gravity is reduced to 1.040 or lower. The spleen is immensely increased in size, density and firmness, all of which is produced by a hyperplasia of the lymphoid tissue of the organ. Adhesions may occur around the spleen and lymphoid tumors may project from it. The lymphatic glands all over the body, but especially those of the groin and neck, become enlarged and hard; there is more or less enlargement of all the glands of the body. The bone marrow undergoes changes of hypertrophy and degeneration, is yellowish in color, and the normal marrow fat disappears. When the changes are limited to the spleen and bone marrow it is called the **spleno-medullary form**; and when the changes are limited to the spleen and lymph glands it is called the **lymphatic form**.

Symptoms.—The onset is very slow and the condition progresses gradually, with a palpable swelling of the abdomen; this is produced by the splenic enlargement and may become so great as to produce great discomfort by pressing upward against the diaphragm, thus hindering breathing, or by pressing against the other abdominal viscera affecting the normal function of the organs pressed upon. Following the enlargement of the spleen the lymphatic glands begin to increase in size. This glandular enlargement is first noticeable in the cervical, then the inguinal, and later in the axillary

region. The glands are enlarged, hard and freely movable at the beginning, but soon coalesce, forming hard masses. The enlargement may be so great as to obliterate the neck and cause the head to appear of a pyramidal shape. When the bone marrow undergoes tumefaction there appears upon the shaft of the long bones nodules from the increased pressure upon the periosteum.

In all varieties there is emaciation, weakness, loss of appetite, feeble pulse, rapid and shallow respiration and impaired digestion, often with diarrhœa.

The blood coagulates slowly and is of a pale, watery consistency. Microscopical examination of the blood reveals an enormous increase in the number of white cells; in extreme cases they may number as many as the red cells. Nearly all kinds of leucocytes can be found in the blood. Finally the red cells are diminished and anemia may develop.

Pseudo-Leukemia

Definition.—This is also known as Hodgkin's disease, and is a malignant disease of long duration, characterized by excessive hypertrophy of the glands of various parts of the body and is associated with a terminal anemia.

Adjustment.—C. P., K. P., and same as leukemia.

Pathology.—In the great majority of cases the spleen is enlarged from an increase in its functioning cells. The bone marrow is converted into a rich lymphoid tissue and there is enlargement of the lymphatic glands of the body. This hyperplasia may affect one gland only, but usually affects several groups of glands, such as the cervical, axillary, inguinal and femoral. Blood examination shows the red cells slightly diminished and the white cells in about the normal proportion. The liver is also enlarged in about two-thirds of the cases, and similar enlargement may involve the kidneys and pancreas.

Symptoms.—The onset is very slow, but the first symptom to attract the attention of the patient is the enlargement

of the cervical glands. This may be followed by an enlargement of the axillary and inguinal glands in the order named, and finally the lymphatic glands of the entire body undergo the enlargement.

At the beginning of the enlargement the glands are hard but freely movable beneath the skin; later they fuse together in large masses by adhesions and are immovable. The massive enlargement of the cervical glands may be so great as to obliterate the neck, giving to the head a pyramidal shape. Dyspnoea may arise from pressure upon the trachea or larynx; dysphagia from pressure upon the esophagus, aphonia from pressure upon the recurrent laryngeal nerve, and local edema of the face and upper extremities from pressure upon the superficial veins draining those parts. The spleen is immensely hypertrophied, interferes with respiration, and may press upon other abdominal viscera. The apex beat of the heart may be slightly displaced. Suppuration or necrosis may occur in the gland. If the quantity of the pus formed is small it may be absorbed and eliminated through the kidneys, but if the quantity is large a fissure or sinus may form, through which the pus will be discharged as it forms. Later the tonsils enlarge and adenoid growths appear in the throat and may press upon the eustachian tube, producing deafness. The mucous membrane of the throat may become raw and be the site of ulcerations, with purulent expectoration and offensive breath.

As the disease progresses the hæmoglobin is diminished and a severe anemia develops. The white cells are still about the normal, or may be slightly increased. This latter symptom differentiates Hodgkin's disease from true leukemia. The duration of the affection is from months to several years, and is a very rare disease.

Purpura

Definition.—An acute condition characterized by the appearance of livid spots beneath the skin, from extravasated

blood, a hemorrhage into the cutis. Also called the purple disease.

Adjustment.—Always local in the zone of the hemorrhage, and if fever is present also adjust C. P. and K. P.

Pathology.—The local subluxation produces pressure upon the motor nerves leading to muscle fibres of the vessel wall at the point where the hemorrhage occurs. This makes a lack of motor power in the muscular fibres and permits them to relax and slightly separate, permitting the blood to slowly ooze between the fibres into the adjacent subcutaneous areolar tissue. At first the spot beneath the skin is red, but as soon as the red cells lose their oxygen it becomes dark in color and of a purple tint. If the hemorrhage is small it is called petechia, and if large and diffuse it is called ecchymosis.

Symptoms.—There are three varieties of purpura—simple or symptomatic purpura, hemorrhagic purpura and purpura neonatorum or purpura of the new born.

In the simple type there is the appearance of minute petechial spots or capillary hemorrhages beneath the skin, which may be local or general and may gradually increase in size until called ecchymosis. This is associated with slight malaise, lassitude, fever and its attending symptoms, and aching pains in the limbs or other parts that may be affected. This simple variety is only a symptom of some other incoordination, such as scurvy, anemia, or febrile diseases, as dengue or spinal meningitis. In such cases the adjustment is given for the condition for which the purpura is a symptom and not for the purpura.

Hemorrhagic purpura is a very severe and often grave form. From the mucous membranes of the body occurs petechia. Soon a large part of the body is covered with a diffuse ecchymosis. A constant oozing of blood from the mucous membranes of the body occurs, so that the stool, urine, and expectoration are all blood stained. Epistaxis is common in these cases. There are moderate fever, great weakness

and depression. The severe cases of this form of purpura are identical with hemophilia.

Purpura neonatorum or purpura of the new born usually occurs in connection with congenital syphilis. If such is the case there will be evidences of syphilis with a hemorrhage from the mucous membranes and beneath the skin. When hemorrhages occur from the mucous membrane of the bladder, ureter or kidney it produces hematuria; if from the lungs or bronchi it produces hemoptysis, and if from the stomach it produces hematemesis or malena. Very frequently the palate and gums are the location of the ulceration and hemorrhages.

Hemophilia

Definition.—An incoordination in which there is an extreme disposition to bleed upon the most trivial injury or in which there are spontaneous hemorrhages.

Adjustment.—Atlas, K. P. and local, if the hemorrhages are confined to a local zone.

Pathology.—This may consist of a weakness in the blood vessel wall in which the muscle fibres are relaxed and slightly separated, and this condition permits the hemorrhage. There may also be an abnormal state of the blood in which the fibrin forming ferment is deficient, so that when bleeding occurs coagulation is retarded.

Symptoms.—There is uncontrollable bleeding upon very slight injury, producing a secondary anemia with paleness of the skin and weakness. The hemorrhages may occur spontaneously from the mucous membranes or beneath the skin, producing purpura. The hemorrhages most frequently occur from the mucous membrane of the mouth, nose, lungs, stomach, intestines and bladder. They may occur in the joints and, when such is the case, are attended with severe pain and swelling. Coagulation is greatly retarded, often requiring from fifteen to forty-five minutes for a slight hemorrhage to stop, while under normal circumstances coagulation will occur

in three to five minutes. The amount of fibrin in the blood is diminished. These hemorrhages are sometimes encountered during parturition, and may be fatal.

Scurvy

Definition.—An incoordination, characterized by great debility, anemia, a spongy condition of the gums and a tendency to hemorrhage.

Adjustment.—C. P., L. S. P., and K. P.

Pathology.—In the infantile form there are subperiosteal hemorrhages. In both forms there is sponginess of the gums and possibly ulcerations. The potassium salts are diminished, the blood is dark in color and very thin. The vessel walls are weak and relaxed, and there may be a general anemia with a decrease in the erythrocytes.

Symptoms.—Infantile Form.—While the child is left alone he will remain quiet, but as soon as he is handled he will cry, and especially so when the legs are moved. There is severe pain in the legs, which is produced by a hemorrhage beneath the periosteum and is soon marked by an observable swelling on the shaft of the bones. This swelling most frequently arises upon the anterior part of the shaft of the tibia; sometimes spontaneous fractures may occur between the epiphysis and shaft of the upper end of the tibia, fibula, or lower end of the femur, and is marked by crepitus upon movement of the legs. The child lies without moving in a state of pseudo-paralysis, with weakness in the spine, deformities of the thorax and protrusion of the eyeball.

Following the proptosis, small subconjunctival petechia appears, and later petechial spots appear over the entire body. The gums become spongy, bleed easily, and often the teeth fall out. Later a cachexia or anæmia develops, a slight irregular temperature arises and there is great debility. Under proper adjustments and eating of the food demanded by the natural appetite, the child rapidly recovers. The patient rarely dies.

Adult Scurvy.—If there is the existence of vertebral subluxations which affect the working of the digestive system so that the food given cannot be properly prepared for absorption and, in addition, should there be an absence of certain ingredients in the food found in vegetables and that are demanded by the appetite, these symptoms will appear. The earliest symptoms are weakness, loss of flesh and pallor of the skin. This is followed by sponginess of the gums, they bleed easily, the teeth become loose and frequently fall out. The breath has a foul odor, the tongue is coated and the appetite is impaired. The skin becomes dry, rough and scaly. Ecchymoses appear under the skin and nodes are formed upon the shaft of the long bones. Respiration and the heart's action are irregular, and there may be a fever of 102 degrees.

The joints are frequently affected and are painfully swollen. There may be edema of the face and ankles, the urine is scanty and highly colored and may contain blood.

Under adjustments the normal amount of mental impulses reach the organs of the digestive system, giving to them normal function, thus giving them power to normally digest the food that is eaten, and also giving to the stomach a normal appetite so that it may call for the kind and quantity of food that is needed for the proper nutrition of the body to overcome this abnormal condition. Adult scurvy is rarely found except in cases where food is deficient in quantity and quality.

Addison's Disease

Definition.—An incoordination characterized by asthenia, depressed circulation, irritability of the stomach, and pigmentation of the skin. Commonly called suprarenal cachexia or the bronzed-skin disease.

Adjustment.—K. P.

Pathology.—The pathology of Addison's disease is localized in the suprarenal capsules and is usually tuberculosis of the glands. The tubercles form on the endothelium of the

arterioles and parenchyma of the gland, increasing in number and coalescing to form tubercular nodules, in which occurs caseation. The tubercles have the same histological consistency as in tuberculosis of the lungs.

Nerve Tracing.—Tenderness can be found upon palpation, leading from the seventeenth intervertebral foramen, becoming diffuse over the region of the kidney.

Symptoms.—The onset of the incoordination is very slow, with a sense of weakness which progressively increases, with anorexia, indigestion, dyspnoea, muscular weakness, palpation of the heart and excessive drowsiness. The symptoms may be classed into three groups, as follows: Pigmentation of the skin, gastro-intestinal disturbances and asthenia or weakness.

Asthenia or weakness is the first symptom present, but may not be recognized until the pigmentation of the skin appears. The languor gradually increases until the patient feels unable to carry on his work. This muscular weakness is due to the loss of function of the suprarenal glands, as they secrete an internal secretion which has to do with the muscular tonicity of the body. The voluntary and involuntary muscles are affected alike, hence dilatation of the blood vessels occur, which slows the velocity of the blood. The skeletal muscles become flabby, the heart weak, and cardiac edema may result.

The pigmentation of the skin is the first symptom to attract marked attention, and at first is of a light yellowish tint but soon becomes dark brown or bronze color. There are usually patches of leucoderma or white skin present around the neck, hands or head. The mucous membranes of the body are similarly affected.

The digestive disturbances are more or less present throughout the entire duration of the disease. They consist principally of anorexia, at times nausea and vomiting, diarrhoea and indigestion. The abdominal muscles are frequently contracted. The usual duration of the affection is one to two years.

DISEASES OF THE SPLEEN

Splenoptosis

Definition.—A lack of motor function in the structures holding the spleen in situ, bringing about a relaxation of the structures and permitting a displacement of the organ.

Etiology.—This is caused by a subluxation of the ninth dorsal vertebra, which impinges the motor nerves leading to the ligaments of the spleen. As a result of the lack of motor function the ligaments become relaxed, stretched and the weight of the organ causes it to descend in the abdominal cavity.

Nerve Tracing.—Tenderness may be traced from the sixteenth intervertebral foramen on the left side, passing below the angle of the scapula to the left hypochondriac region or to the left renal region over the spleen.

Symptoms.—If the organ is not enlarged and the degree of movability is slight no symptoms will arise, and the displacement can only be recognized upon physical examination of the patient. Usually the spleen is enlarged, and when such is the case a noticeable distention of the abdomen on the left side may be seen. There is a dull bearing-down pain in the left side from pressure upon other abdominal viscera. Sensations of bearing down and weight in the left side. Upon palpation the spleen can be located, and upon percussion the area of splenic dullness is increased.

Rupture of the Spleen

Definition.—A condition in which the tissues of the spleen become separated and its vessels ruptured, thus permitting the escape of blood into the abdominal cavity.

Adjustment.—Ninth dorsal vertebra.

Pathology.—Rupture of the spleen may be pathologic or traumatic. When traumatic the fibres of the vessel walls may be torn, permitting the intraabdominal hemorrhage. When pathologic it may occur as the result of various pathological

conditions, in which there is erosion of the tissue, including the vessel walls, or it may be in case of extreme hyperemia, in which the degree of relaxation is so great as to permit the flow of blood from the vessels into the abdominal cavity.

Symptoms.—The symptoms are those of concealed hemorrhage, beginning with pain in the region of the spleen and great restlessness with turning of the body from side to side and hunger for fresh air. The face becomes pale, pinched and anxious, the extremities are cold and the body is covered with cold sweat. The respirations are hurried, shallow and sighing. The radial pulse is rapid at first, weak and irregular, finally becoming imperceptible. The mind is usually clear but there may be delirium, and if the hemorrhage is large there may be syncope. Nausea and vomiting may take place. The heart beats violently at the onset because of the undue excitement and fear of impending death, but rapidly becomes feeble and finally stops. If the hemorrhage occurs during a febrile period the fever falls rapidly to subnormal.

Splenic Anemia

Definition.—This is also known as Banti's disease, and is a form of simple anemia associated with enlargement of the spleen.

Adjustment.—Spl. P., K. P., and local for digestive disturbances.

Pathology.—This consists principally of an enlargement of the spleen, in which there is a hyperplasia of the reticulum or interstitial tissue of the organ, which replaces and destroys the lymphoid tissue. There is a decrease in the number of red cells and hæmoglobin and a slight increase in the number of white cells. Microscopical examination of the blood also reveals the presence of pathological red cells, such as the microcytes, megalocytes and various nucleated cells.

Symptoms.—This begins insidiously with sensations of weight and bearing down in the left side of the abdomen, followed by distention of the abdominal walls. The spleen can

be felt upon abdominal palpation, and is found to be enlarged and hardened. Later pigmented spots will appear upon the skin and there may be the presence of symptomatic purpura, ascites, pallor of the skin, and a profound anemia soon develops. The increase of white cells, if present, is always small and the other lymphatic glands do not enlarge. The cardinal symptoms are splenic enlargement with anemia and no other lymphatic enlargement.

DISEASES OF THE THYROID GLAND

Simple Goitre

Definition.—An incoordination in which there is an excessive increase in the bulk of the thyroid gland.

Etiology.—Subluxations at lower cervical, usually 6th, and S. P.

Pathology.—This usually consists of an overgrowth of the tissue of thyroid gland from an increase in the cells of the glandular structure itself. If the increase is in the reticulum or connective tissue it is called fibroid goitre. The swelling may be edematous, and then is called edema of the gland, and is not a true goitre. Vascular goitre is an engorgement of the vessels of the thyroid gland because of dilatation of the vessel walls. Cystic goitre is an accumulation of fluid in a space in the gland.

Nerve Tracing.—Tenderness is traceable from the sixth intervertebral foramen on either side, passing outward and becoming diffuse over the region of the gland. Tenderness may also be traceable from S. P. on the right side, passing out beneath the scapula and axilla and traceable upward over the chest, under the clavicle to the region of the thyroid gland.

Symptoms.—Goitre may be unilateral or bilateral, and the enlargement may be evenly or unevenly distributed over the gland. The enlargement is the first noticeable symptom and may not be sufficient to produce pressure symptoms, such as dyspnoea from pressure upon the trachea, dysphagia from

pressure upon the esophagus, and aphonia from pressure upon the larynx or inferior laryngeal nerve. The size of the goitre may vary greatly, according to its duration and form. Fibroid goitres usually attain the largest size, the bulk of the goitre equalling that of the head in extreme cases. Cases are on record in which the circumference of the neck has diminished five inches during a period of three months' adjustments. Vascular goitre usually disappears readily under adjustments; in the more remarkable cases they have entirely disappeared after less than one week's adjustments. Occasionally a goitre may apparently become larger and softer after taking a few adjustments, which is a good sign, as it is more readily absorbed when soft.

Exophthalmic Goitre

Definition.—A general cachectic incoordination characterized by enlargement of the thyroid gland and protrusion of the eyeballs.

Etiology.—Exophthalmic goitre is caused by subluxations at lower cervical, usually sixth, and S. P.

Pathology.—This consists of hypertrophy of the gland and often a dilatation of the vessels, producing stasis of blood and allowing an infiltration of serum into the adjacent tissue. The vessels behind the eyeball also undergo a similar change and the fat is markedly increased in quantity. In the late stages of the disease there is a brownish pigmentation of the skin with anemia and dropsy.

Symptoms.—This is also known as Grave's disease, Basedow's disease and Parry's disease. The onset of the symptoms is usually gradual and the circulatory symptoms are the first to appear. These usually consist of palpitation and tachycardia. The pulse rate may vary from 100 to nearly 200, the rapid pulse occurring in paroxysms and often follows excitement or exertion. There may be visible pulsation of the vessels in the neck, and the patient may experience ringing in the ears from the forcible cardiac action.

The next symptom to make its appearance is the enlargement of the gland, and in exophthalmic goitre this is usually small and is largely confined to the inner surface of the gland, hence is called inward goitre. The enlargement is confined to one side of the gland in some cases, but usually is evenly distributed over the entire gland.

The exophthalmos begins with inability to rotate the eyeball in following a moving object. The inability of the patient to rotate the eyeball necessitates turning of the head in watching a moving object. It can be noticed that the lids do not properly cover the eyeball when the eyes are closed. The eyeball bulges forward and gives to the face a staring expression. Tremor is usually the latest symptom to appear, and is absent in some cases. Very rarely it is the first symptom to appear, and is characterized by nervousness, irritability, inability to carry food to the mouth without spilling, and may terminate with general tremor. In addition to the foregoing symptoms there may be headache, insomnia and irritability of temper, attacks of despondency and pressure symptoms, as found in simple goitre. Late in the disease brownish spots appear upon the skin and general anemia develops.

Myxedema

Definition.—An abnormal condition in which there is a deficiency in the thyroid secretion and an atrophy of the gland.

Adjustment.—Lower cervical, S. P., and K. P.

Pathology.—The first and principal condition which appears is atrophy of the thyroid gland, which is followed by the development of cachexia and a deposit of a gelatinous substance in the subcutaneous areolar tissues, giving to the skin a hard inelastic consistency.

When occurring in infants, it is known as cretinism.

Symptoms.—Cretinism.—At birth the child may appear normal, but during the early months of its life it will be noticed that its bodily development is impaired, and in some

cases the body does not develop symmetrically. The head may be abnormally large or small, the fontanels fail to ossify, the teeth appear late or may be deformed when appearing, the nose becomes broad and flat, the tongue is excessively large and may hang from the mouth, the eyes are situated far apart and lack the expression of intelligence. The hair is thin and dry, the skin is rough, the arms and legs may be retained in the infantile state and the child does not learn to walk or walks imperfectly. The result is idiocy or imbecility.

Myxedema in adults is marked by an apparent swelling of the skin and an increase in the bulkiness of the body. This swelling does not pit upon pressure, which distinguishes it from dropsy. The skin is dry and rough, the hair is thin and dry, the lips thicken, the face assumes a round full-moon shape and becomes expressionless. The skeletal muscles become soft and flabby and of insufficient strength to maintain the weight of the body. The hands and feet enlarge and a characteristic deformity of the hands occur, known as the spade hand. The skin becomes a yellowish pale color and the mentality is sluggish. The patient may finally become mentally unbalanced.

SECTION 12

DISEASES OF THE KIDNEY

Urinalysis

Urine is an excretion formed by the kidneys, in which nitrogenous products are thrown from the body. It is of a light amber color, of an acid or saline taste and has an acid reaction.

The specific gravity of normal urine is 1.020, and is obtained by the use of the urinometer. The normal quantity of urea in urine is $1\frac{1}{2}$ to 2 per cent, or about 30 grams.

To find the number of grams of solids in urine, multiply the last two figures of the specific gravity by Haser's coefficient (2.33), and the result is the number of cc, or grams of solids per 1,000 cc of urine.

The normal acidity of urine is 40 degrees, and is determined by the use of the acidimeter. To find the *degrees* of acidity, place 10 cc of urine in the acidimeter, to this add 2 drops of Phenol Phthalein (1 per cent), and then add 1-10 decinormal caustic soda until the mixture becomes a permanent pink. Read degree of acidity on the graduated tube.

The normal quantity of urine voided in 24 hours is about three pints, or 1,500 cc. The total amount of solids in normal urine varies from 3.59 to 4.60 per cent of this amount.

Urea	forms	2%	or about	30	grams
Chlorides	form	.6 to 1%	or about	6 to 10	grams
Sulphates	form	.1 to .2%	or about	1 to 2	grams
Phosphates	form	.17 to .26 %	or about	1.7 to 2.6	grams
Ammonia	forms	.04 to .06 %	or about	.4 to .6	grams
Uric acid	forms	.016 to .083 %	or about	.16 to .83	grams

In addition to the above there are traces of indican, creatin, lime, magnesia, potash, and about 10 grams of other

extractives that are excreted from the fluids of the body by the kidneys. These extractives consist of mucus, destroyed cells, granules of fat and other substances.

Test for Indican

Take equal parts of urine and HCl in a test tube. Best to have about 2 cc of each. To this add a few drops of CHCl_3 and then add HNO_3 drop by drop, and if indican is present the result is an indigo blue color.

Albumin Test

Albumin is commonly found in the urine in inflammatory diseases of the kidney, and is usually detected by very simple tests.

Heller's Heat Test.—Place two or three cc of urine in a test tube and boil over an alcohol lamp. If albumin is present it will soon coagulate and give to the urine a cloudy appearance. To determine whether this coagulate is albumin or mucus add a few drops of acetic or nitric acid. If after dropping in the acid the coagulate should clear up there is no albumin present and the cloudiness is due to the presence of mucus. If the cloudiness remains it is due to coagulated albumin.

Heller's Ring Test, or the Nitric Acid Test.—Place two cc of nitric acid in a test tube and overlay with the suspected urine. If albumin is present a white ring will form at the junction of the urine and the acid.

Esbach's Quantitative Test for Albumin

For this test Esbach's albuminometer should be used. This tube is especially graduated for the purpose. Fill the tube to the mark U with urine, then pour in Esbach's solution to the mark R. Shake until well mixed and let stand for twenty-four hours, at which time the albumin has precipitated and collected at the bottom of the tube. By reading the

graduated scale you have the number of grams of albumin per 1000 cc of urine.

Esbach's solution is composed of picric acid 10 parts, citric acid 20 parts and water 1000 parts. Should be prepared 24 hours before using.

Test for Bile Pigment

For this test use the albuminoscope. Mix 30 min. each of urine and nitric acid and place in the large side of the albuminoscope. To this add 30 min. of sulphuric acid in the funnel side of the tube. If bile pigment is present a green ring will form at the junction of the two fluids.

Test for Bile Salt

Mix a reagent consisting of water 2 parts, peptone 1 part and acetic acid 1 part.

Place the reagent in the large side of the albuminoscope and add the urine in the funnel side. If bile salt is present a white zone is present at the junction of the reagent and the urine.

To Determine the Cause of Precipitate in Urine

1. Heat, but do not boil, for a few seconds and if the top of the precipitate clears up it is due to the presence of urates.

2. If the heating does not cause it to clear up, add a few drops of acetic acid. If it then clears up the precipitate is due to the presence of phosphates.

3. If the precipitate still remains add KOH, and if after adding this it clears up it is due to pus, mucus or bacteria.

Quantitative Test for Sulphates

The reagent for performing this test is composed of barium chloride 4 parts, water 16 parts, and hydrochloric acid 1 part. To 10 cc of urine add 5 cc of the above reagent.

Place the mixture in the graduated tube of the centrifuge and revolve three periods of five minutes each. The sulphates will precipitate in the bottom of the tube and the scale will give the number of grams per 1000 cc of urine.

Phosphates

To 10 cc of urine add 2 cc of a 50 per cent solution of acetic acid and 3 cc of a 5 per cent solution of uranium nitrate. Perform as above.

Chlorides

To 10 cc of urine add 10 or 20 drops of nitric acid, then fill up the tube to 15 cc with ($\frac{1}{8}$ solution) silver nitrate. Place in the centrifuge and revolve. The chlorides precipitate and collect at the bottom of the tube, the scale giving the number of grams per 1000 cc of urine. By permitting the tube to stand for 24 hours the precipitate will form as if revolved in the centrifuge. Purdy's centrifuge is usually used in this work, and the above three methods are known as Purdy's methods.

Test for Sugar

The four tests most commonly used for the detection of sugar in the urine are Trommer's, Haines', Fehling's and Parvy's. They are also known as the copper tests for sugar.

Haines' Test

Haines' test is more commonly used than any of the others, because the solution is more easily prepared and the test more easily performed. Haines' solution consists of water $\frac{1}{2}$ oz., glycerine $\frac{1}{2}$ oz., copper sulphate 30 grs., potassium hydrate 5 oz. If accuracy is desired the solution should be freshly prepared before use. Place 5 cc of the solution in a test tube and bring to a boil, then add urine drop by drop with a pipette, and the solution becomes an orange yellow if the urine contains sugar.

Trommer's Test

To 5 cc of potassium hydrate add as much copper sulphate as can be dissolved. Then apply heat and boil for one minute. To the boiled solution add urine drop by drop and a yellowish precipitate will be formed.

Fehling's Test

Solution No. 1. Copper sulphate 34.62 grams and add enough water to make 500 cc.

Solution No. 2. Sodium potassium tartrate 173 grams and add 500 cc of sodium hydrate (Sp. Gr. 1.140).

Take equal parts of solution No. 1 and No. 2 and add four times as much water. Apply heat and boil the upper part of the solution in the test tube. When brought to a boil drop in urine drop by drop, and if the suspected urine contains sugar there will be an orange or orange-yellow precipitate.

Parvy's Test

Use Parvy's solution, which is composed of copper sulphate 320 grains, potassium tartrate 640 grains, caustic potash 1280 grains, and water 20 ounces.

The test is performed the same as the foregoing ones. Two or three cc of the solution is brought to a boil and then urine is dropped in, and if the solution changes its color and becomes yellowish or orange it contains sugar.

Benedict's test for sugar is said to be ten times as sensitive as any of the foregoing tests. The reagent is made up of copper sulphate 17.3 grams, sodium citrate 173 grams, sodium carbonic crystals 200 grams, water 1000 grams. Boil 5 cc of this reagent in a test tube and add 8 to 10 drops of urine. After adding the urine, boil for one or two minutes, no more, and if sugar is present there is a red, yellow or green precipitate. If the quantity of sugar is very small the precipitate will form after the urine is cool.

Indications from Urinalysis

Chemical examination of the urine often reveals symptoms which are of considerable diagnostic importance, and a few of the most frequent indications are as follows:

1. In **acute diffuse nephritis** the quantity of urine is diminished to five or six ounces in twenty-four hours, and in severe cases may be totally suppressed. The specific gravity is moderately high, ranging from 1.020 to 1.025, and albumin is present in large amount. The exact per cent can be determined by Esbach's quantitative test.

2. **Chronic diffuse nephritis** is characterized by diminished quantity of urine, having a low specific gravity, frequently being as low as 1.010, and contains an abundance of albumin. More albumin is found in the urine in chronic diffuse nephritis than any other disease.

3. **Chronic interstitial nephritis** is characterized by polyuria of a light yellow or clear color, and having a low specific gravity. Albumin is very scanty, and often cannot be detected at all. There may be a few casts in the urine.

4. **Amyloid kidney** is marked by increased quantity of urine of a clear pale color, having a low specific gravity, with little or no sediment. There is the presence of casts and an abundance of albumin.

5. **Diabetes mellitus** is marked by a great increase in the quantity of urine, sometimes reaching three or four gallons in twenty-four hours. The urine is of a clear pale color and has a high specific gravity, varying from 1.030 to 1.050. The urine has a sweetish odor and contains an abundance of grape sugar, increased urea, acetone and diacetic acid.

6. **Diabetes insipidus** is characterized by a marked increase in the quantity of urine; often three or four gallons may be voided in twenty-four hours. The urine is of low specific gravity, ranging from 1.002 to 1.009, but does not contain sugar or albumin.

7. **Pyelitis** is marked by cloudy urine having an acid reaction, and contains pus, destroyed epithelial tissue and blood, the latter being determined by microscopical examination rather than chemical examination. In case the inflammation involves part of the substance of the kidney the urine will also contain albumin and casts.

8. **Tuberculosis** or other suppurative diseases affecting the kidney is marked by the presence of indican in the urine. The urine may also contain pus, blood, albumin and destroyed epithelial tissue.

Nephroptosis

Definition.—This is also known as movable kidney, or prolapsis of the kidney, and is a condition in which the structures holding the kidney in situ become relaxed and stretched, permitting the organ to drop.

Etiology.—This is caused by a subluxation at K. P. causing impingement of the motor nerves leading to the structures holding the kidney in place.

Pathology.—There being a lack of motor function expressed in the structures holding the kidney in situ, a relaxation of these structures is permitted, thus allowing the kidney to be displaced. The adipose tissue in which the kidney is imbedded is absorbed and the renal vessels are elongated. This condition most frequently occurs in lean women, and especially those having borne children.

Symptoms.—If the degree of the prolapsis is slight there may be no symptoms present. If the movability is great there is a dragging pain in the lumbar region or deeply in the abdomen. Occasionally there is severe colicky abdominal pain, with nausea, vomiting and extreme prostration. The kidneys may be palpable and nerve-tracing often reveals their exact location.

Renal Congestion

Definition.—A condition in which there is an excessive accumulation of blood in the vessels of the kidney.

Etiology.—Renal congestion is caused by a vertebral subluxation at the K. P. region, producing pressure upon the motor nerve fibres leading to the vessels of the kidney, preventing a normal flow of the motor impulses and producing a relaxation of the vessel walls, thus permitting an overabundant accumulation of blood.

Pathology.—If this congestion occurs in the arteries it is called active congestion, and if of the veins is called passive congestion. The vessel walls become stretched, inelastic and thin. In active hyperemia the redness is increased, and in the passive type the kidneys become a dark purple color. There may be associated inflammation which gives rise to a catarrhal exudate from the ducts of the pyramids.

Nerve Tracing.—Tenderness is found radiating from K. P. to the region over the kidney. This may be localized in a small area or may be diffuse over the entire kidney.

Symptoms.—This begins with a tired, aching pain over the kidneys which intensifies after a time and radiates diagonally across the abdomen following the course of the ureters to the bladder and groin. The bladder is very irritable, marked by great frequency in urination, although the amount may be diminished. There is headache, loss of appetite and may be vomiting. The patient is weak and irritable. There may be hematuria from the slow oozing of blood through the vessel walls. The urine may contain a small amount of albumin and casts. If the hyperemia is prolonged the termination is nephritis.

Uremia

Definition.—An abnormal condition in which there is the retention of certain excretory substances, part of which is urea, within the body.

Etiology.—Uremia is caused by a K. P. subluxation which produces impingement upon the nerves leading to the kidney, having to do with the function of excretion or calorificity, or both.

Pathology.—Since uremia is a general condition resulting from improper activity of the kidney, there may be a great variety of pathological conditions capable of producing the symptoms. The most common, however, is acute or chronic nephritis in which there is an excess of urea retained in the blood, because of the inability of the kidney to excrete it.

Symptoms.—This disease is also known as uremic intoxication, and uremic poisoning, and may develop gradually or suddenly. The onset in the majority of cases is slow, and begins with a decrease in the urinary secretion and the presence of edema, most noticeable in the eyelids and ankles. The characteristic renal pallor soon appears, the skin becomes dry and has a urinary odor. The patient has occipital or vertical headache, irritability of temper, nausea and vomiting, itching of the skin, and finally uremic convulsions may supervene. Occasionally these convulsions may be the first symptom to attract the attention. They vary in form, often closely simulating the convulsion of epilepsy, but in most cases have a fever of 103 to 106 degrees. The convulsion may consist of a single paroxysm, during which time the muscles are in a tonic spasm, or there may be a series of muscular contractions, the entire attack lasting several hours. Consciousness may be affected in various degrees, but, as a rule, the fever case has coma, especially following the convulsion. This coma is deep, accompanied by fever and stertorous breathing. The respirations are accelerated and the pulse is rapid. The urine will always show the presence of albumin, and a simple test for albumin will often confirm the analysis when the other prominent symptoms are present.

Uremic coma differs from apoplectic coma in that there is the absence of hemiplegia, no conjugate deviation of the eyes and the pupils not equal.

Epileptic coma is of short duration, is preceded by an epileptic convulsion, and the urinary symptoms of the skin and urinalysis are absent. For further differentiation, see Coma.

Acute Bright's Disease *acute Nephritis*

Definition.—This is also known as acute nephritis, and is an acute inflammation of the parenchyma of the kidney.

Etiology.—Subluxation at K. P.

Pathology.—The inflammation usually affects the uriniferous tubules. The vessels become hyperemic, the lining becomes swollen, the kidney is enlarged, and the cortex is a deep red color. Exudation of serum, fibrin, blood cells and debris into the tubules form casts and fill up the lumen of the tubules.

Symptoms.—The onset may be sudden or gradual, and is first marked by the development of dropsy. The edema is usually first seen beneath the eyelids and about the ankles, but soon spreads to the entire body, developing into general dropsy or anasarca. The abdomen becomes distended, the diaphragm is pressed upward, thus interfering with respiration, and necessitates the patient assuming the erect position. There is usually slight or moderate fever, nausea, vomiting, pain over the kidneys, dry, harsh skin, with a urinary odor, and a rapid, full pulse. Uremic symptoms result. The urine is of high specific gravity (1.025 to 1.030), is very scanty in quantity, often being as low as four to five ounces in 24 hours, is of a smoky color, albumin is present in large quantities, and casts from the tubules can be found upon microscopical examination. See urinalysis.

Chronic Diffuse Nephritis

Definition.—This is also known as chronic Bright's disease, and is a chronic diffuse inflammation of the cortical substance of the kidney.

Etiology.—K. P. subluxation.

Pathology.—Pathologically this is known as the large white kidney, often becoming twice the normal size; it is smooth and of a whitish-yellow color. The vessels are hyperemic, the tissue of the organ swollen, the tubules thickened and dilated, and filled with an exudate consisting of destroyed epithelium, serum and fibrinous casts. There may be a prolifera-

tion of the connective tissue cells, with a resulting thickening of the interstitial tissue. Upon the thickening of the connective tissue it contracts and diminishes the size of the kidney.

Symptoms.—The onset of chronic Bright's disease is always gradual, and is usually first called to the attention of the patient by a puffiness of the eyelids, weakness and general ill health.

There is suppression of urine, more gradual than in the acute form, which gradually leads to the uremic symptoms. The urine is scant, high-colored, and contains an abundance of albumin. Its specific gravity is low (1.010), and the urine contains casts of the tubules, called tube casts. The dropsy increases, interfering with respiration so that the patient may have to constantly assume an erect posture, even while sleeping. The dropsy will be most noticeable in the parts of the body that are in the lowest level; that is, if the patient should lie upon the right side, the right arm, leg and right side of the face and body will be swollen, while the opposite side may show but slight signs of edema. Anemia becomes pronounced from the retention of urine in the blood. This is produced by the K. P. subluxation causing pressure upon the nerves leading to the kidney, making it inflamed and unable to perform its normal function.

Chronic Interstitial Nephritis

Definition.—A chronic inflammation of the intervening connective tissue of the kidney, with a resulting hardening and contraction of the organ.

Etiology.—This is caused by a subluxation at K. P., producing impingement upon the nerves leading to the connective tissue of the kidney, and so interfering with its calorific function that there is excessive heat produced in this connective tissue. The thickening and hardening that results is produced by the inflammation.

Pathology.—This usually affects both kidneys; they becoming inflamed, the vessels of the connective tissue becoming

hyperemic, and the connective tissue cells proliferating and contracting. This contraction decreases the size of the kidney, so that pathologically this is called the small white kidney. The cortex becomes thin from the pressure of the connective tissue, and is of a dark brown color. This is also called sclerosis of the kidney, cirrhosis of the kidney, contracted kidney, and chronic Bright's disease.

Symptoms.—The condition may exist for years before the symptoms present plainly point to the disease. Usually the first symptom to attract the patient's attention is the frequent voiding of large quantities of pale urine. Urinalysis shows the urine has a low specific gravity (1.005 to 1.010), and contains a few casts and occasionally a small amount of albumin. The vision rapidly fails and the conjunctiva is edematous; sometimes subconjunctival ecchymosis appears, giving to the eye a bloodshot appearance. There are frequent attacks of vertigo, headache, dyspnoea, palpitation, progressive anemia and weakness. The skin becomes yellowish in color and is dry and scaly. Toward the end the urine is decreased in quantity, and general dropsy may develop, with uremic convulsions.

Amyloid Kidney

Definition.—An abnormal condition of the kidney in which it undergoes a starchy degeneration, there being an infiltration of an albuminoid material resembling boiled starch.

Adjustment.—K. P.

Pathology.—The subluxation at K. P. produces pressure upon the nerves governing the function of nutrition, thus perverting its expression in the metabolism of the organ. The result of this abnormal metabolism is the infiltration of the amyloid substance, which occurs among the vessels and around the glomeruli. The pressure exerted upon the functioning structure of the kidney is such that it produces atrophy and disordered function.

Symptoms.—Amyloid kidney is called Bright's disease by some authorities, but most authorities consider it a separate affection.

Amyloid degeneration of the kidney is usually associated with a similar degeneration of the spleen, liver and pancreas. The liver and spleen become enlarged so that they may be palpable, the urination is increased in quantity and also in frequency. The urine is pale in color, of low specific gravity, and contains an abundance of albumin. The blood pressure is raised, the left ventricle becomes hypertrophied, and uremia develops, with dropsy.

In amyloid kidney there is usually the history of prolonged suppuration, as in tuberculosis or syphilis, palpable enlargement of the spleen and liver, polyuria, and presence of albumin in the urine.

The adjustment of the vertebral subluxation at K. P. will remove the pressure upon the nerves leading to the kidney, and permit the normal transmission and expression of the mental impulses at the periphery of the nerves. This will result in normal nutrition as well as normal expression of other functions in the kidney, whereby it gradually regains its former normal condition.

Pyelitis

Definition.—An acute catarrhal inflammation of the mucous membrane lining the pelvis of the kidney. If the inflammation is suppurative in character it is called pyelonephritis.

Etiology.—Pyelitis is caused by a K. P. subluxation impinging the calorific nerves leading to the mucous membrane of the pelvis of the kidney, bringing about a perversion of the expression of the calorific function, known as inflammation.

Pathology.—The mucous membrane being inflamed, there is hyperemia of its blood vessels, a swelling of the membrane

from infiltration of serum, and a catarrhal exudation from its surface. The exudation consists of abnormal mucus, destroyed epithelium and blood corpuscles. If the inflammation becomes suppurative in character the exudation is purulent, or contains pus of a yellowish-white color. The process may extend into the substance of the organ after having destroyed the mucous membrane so that its function is impaired and uremia will result. The pus is discharged with the urine and can be found upon microscopical examination of the urine.

Symptoms.—When acute the onset is with chilliness and severe lumbar pains, which may extend downward along the course of the ureters. Superficially there is great tenderness over the region of the kidney radiating from the lower dorsal intervertebral foramen. Fever may be present and usually has an irregular course, especially when the inflammation is suppurative. There is frequent voiding of urine of a white or cloudy color, which may be acid or alkaline in reaction. If hemorrhages occur from the vessels of the lining membrane, there will be hematuria, and if suppuration occurs, there will be pus in the urine. When the inflammation is suppurative the fever is of the intermittent type, there being chills and sweats. Cerebral symptoms may appear, in which there is delirium, stupor, coma and, possibly, uremic convulsions. The inflammation may become chronic, and the discharge will occur with the urine more or less continuously, with aching in the loins. The pain and tenderness are increased by stooping or lifting. As a rule, the patient is emaciated and weak.

Hydronephrosis

Definition.—Is an accumulation of urine, water or other fluid in the pelvis of the kidney, which eventually forms a cystic condition of the kidney.

Adjustment.—K. P. or upper lumbar.

Pathology.—There is obstruction of the ureter. This obstruction may be produced by a lodged renal calculus, or a

constricted ureter, or a twisted ureter, as may occur in floating kidney.

Symptoms.—The condition may exist without giving rise to any symptoms if the ureter is only partially obstructed and the accumulation is small. If the accumulation of fluid is large the kidney may be prolapsed and will produce pressure symptoms. Among the pressure symptoms are pain of a bearing down or dragging character, dull aching pain in the lumbar region, and upon palpation an enlarged organ can be felt. If a small opening exists in the ureter there may be frequent and immense urination, after which the cyst or enlarged kidney cannot be palpated. Should the obstruction be removed all symptoms will disappear, but should the obstruction be permanent the organ will become infiltrated with its own secretion, with the result that the organ becomes functionless and undergoes atrophy, the entire work being thrown upon the other kidney. Hydronephrosis is always unilateral. Should both ureters be obstructed the result would be uremia and death.

The condition may simulate acute nephritis, but fever is absent, dropsy absent or less in degree, and urinalysis will positively prove the difference.

Nephrolithiasis

Definition.—It is a crystallization and adhesion of the calcareous material of the urine, which forms into irregular shaped calculi in the pelvis of the kidney. Nephro means kidney and lithos means stone. Hence the term nephrolithiasis. This is also called kidney stone, renal calculus and kidney gravel.

Etiology.—The subluxation at K. P. produces excessive heat in the pelvis of the kidney. This excessive heat tends to crystallize the mineral elements of the urine, which, when crystallized, adhere to any solid substance that may be found in the pelvis of the kidney, such as particles of pigment, mucus, or blood. This forms a nucleus, and as more crystals

are formed they adhere to the small mass, increasing its size until it could be called gravel or stone. This stone may be of various kinds, according to the kind of mineral matter of which they are composed. The principal varieties are uric acid calculi, urate of ammonium, lime and calculi composed of phosphates. Most frequently these calculi are irregular in shape, some being round, others elongated with many sharp corners.

Symptoms.—So long as the stone remains in the pelvis of the kidney no symptoms arise, and their presence cannot be determined. When a calculus leaves the pelvis of the kidney and passes into the ureter it produces intense agonizing pain, and is called renal colic. The small irregular stones produce the most pain, because of their sharp processes, which lacerate the delicate mucous membrane lining the ureter, as they are forced through it.

The pain begins in the dorso-lumbar region and radiates downward diagonally across the abdomen to the bladder. The abdominal muscles are contracted, the testicle on the affected side is drawn up, and the patient often rolls around in a fit of intense agony. The surface temperature is lowered, the skin is pale; there may be nausea and vomiting, and occasionally syncope. There may be dribbling of urine, which is stained with blood, or there may be frequent urinations of small quantity. The pain may be intermittent when the stone becomes lodged or is stopped, recurring when it again starts, or may be continuous for several minutes or hours, ending suddenly when the stone reaches the urinary bladder, after which there may be copious urination, the urine containing blood.

Very rarely the stone remains permanently lodged in the ureter, the result being hydronephrosis. An inflammation may arise at the point of lodgment, finally becoming suppurative, with recurring chills, fever and sweats.

Following the passage of the stone the patient is prostrated, and may fall into a sleep from exhaustion. There may

be aching across the back for several days, and the urine will contain a heavy sediment which settles upon standing.

Differential Symptoms.—Hepatic colic may simulate right renal colic, but differs in that there are jaundice, clay-colored stools, pain radiating upward under the right shoulder blade, tenderness over the right hypochondriac region, Li. P., subluxation, and nerve tracing from Li. P. to region over liver.

Right renal colic may also be simulated by appendicitis, but the latter differs in that it is characterized by fever of 102 degrees or over, tenderness at McBurney's point, which is traceable to the second lumbar vertebra, indicanuria, constipation, right thigh flexed upon the abdomen, retraction of the abdominal muscles, and dyspnoea, with shallow breathing.

Cystitis and stone in the bladder differ in that the pain is located in the hypogastric region in the median line of the body, pain more severe after urination, urination is easier when lying than when standing, as the stone may obstruct the urethra, and the calculus may be felt with a sound.

Cancer of the Kidney

Definition.—A malignant tumor composed of epithelium or connective tissue growing upon the kidney.

Adjustment.—K. P. This K. P. subluxation impinges the nerves that have to do with the growth and multiplication of cells, and affects these cells in such a way that their growth is riotous, or cannot be controlled, thus becoming tumorous. The tumorous mass then undergoes a form of depletion known as colloid degeneration. The cancer may be carcinoma or sarcoma. For pathology see Carcinoma.

Symptoms.—So long as the growth is small and there is no decay, the symptoms will be absent and the condition not recognized, unless upon abdominal palpation, or an X-ray negative may reveal the growth. As the growth becomes larger there will be dull aching pain in the dorso-lumbar region, with a sense of weight or bearing down. Because of the added

weight there may be nephroptosis. There are alterations in urination, the urine contains blood and pus, the patient becomes emaciated and debilitated, and the cancerous cachexia develops. The appetite is poor, vomiting is common, and the kidneys may finally lose their power of excretion, whereupon dropsy develops, with fever and extreme prostration.

Perinephritic Abscess

Definition.—A suppurative inflammation of the capsule surrounding the kidney, in which there is the localized accumulation of pus.

Adjustment.—This is caused by a K. P. subluxation which impinges nerves leading to the capsule of the kidney, resulting in a suppurative inflammation, with the formation of pus. This pus accumulates between the capsule and the kidney substance, or within the connective tissue spaces surrounding the kidney. Perforation and peritonitis may occur.

Symptoms.—This begins with severe aching pains over the region of the kidney, and since the condition is unilateral the pain will be localized over one kidney. There is recurring chills, fever and sweats. The patient lies in the dorsal posture, with the thigh on the affected side flexed upon the abdomen. Upon palpation the kidney is found to be enlarged and excessively tender, the tenderness often being so great that the palpation of the organ is impossible. The spinal muscles over the affected kidney may be swollen, and tenderness is traceable from K. P. over the entire region of the affected kidney.

There are no urinary symptoms, unless the kidney itself is also affected. It differs from pyelitis in that there is no hematuria, nor is there pus in the urine; neither is the acidity of the urine increased.

SECTION 13

DISEASES OF THE NERVOUS SYSTEM

Epilepsy •

Definition.—Is an incoordination of the educated brain lobes, characterized by a loss of consciousness, with or without tonic or clonic convulsions.

Etiology.—Epilepsy is caused by an Atlas subluxation, but since it is frequently associated with disorders of the generative organs, heart, stomach, or spleen, the adjustment should also be made local for the associated condition.

There is no regular or constant pathological condition in epilepsy, but often it is found that there is a chronic thickening of the meninges of the brain, tumor of the brain and heart block.

Symptoms.—There are two forms of epilepsy, the grand mal and the petit mal. The temporary loss of consciousness without the convulsion is known as the petit mal, and the loss of consciousness with the convulsion is called the grand mal.

The **grand mal** is often preceded by premonitory symptoms, such as vertigo, malaise, mental depression, and the epileptic aura. This aura may be different in different people, but in most cases consists of an apparent vapor arising from the trunk upward toward the head. Immediately following the aura, or when the imaginary vapor reaches the head, the patient utters a cry, turns the head to one side and passes into a tonic convulsion. During this tonic spasm the trunk is rigid, the extremities are extended, the hands are firmly closed and the jaw is clenched. The respiratory muscles are fixed so that the patient becomes deeply cyanosed.

The duration of the tonic spasm varies from a few sec-

WHAT BODY OF YOURS

By J. W. BARTON, M. D.

By JAMES W. BARTON, M.D.
Epileptics Can Be Helped.

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As a student I learned that there were certain ailments that were incurable, but that treatment should be given during attacks. These ailments included such conditions as heart disease, angina pectoris, asthma and epilepsy.

Nowadays all these conditions are being helped because research men have been investigating their causes. Epilepsy was just considered as some "brain" trouble and there was nothing that could be done about it. Now they think of epilepsy as a symptom only, just as headache can be a symptom of twenty or more ailments. It is said that there is one epileptic to every 200 people in North America.

There are three factors in every case of epilepsy; first a change in the structure of the nervous system; second, an instability of the nerve cells due to heredity, mental conflicts, or little chemical changes within the cells themselves; third, something interfering with the circulation of the blood within the brain; from the ductless glands, the lungs, or very frequently from the digestive tract.

The first thought in the treatment is to try to locate the cause—any family history of nervous ailments, any lack of development physically, any foods that may affect this particular patient, any previous infectious diseases, or any head injuries.

There should also be an X-ray examination of the head, an examination of the workings of the ductless glands, of the teeth, tonsils, sinuses, gall-bladder, and so forth; X-ray examination of intestinal tract and examination of spinal fluid, urine and blood. Further, epilepsy is one ailment where the attacks should be treated vigorously, as repeated attacks certainly damage the nervous system. As you know the drug used all over the world, the bromides, is the most effective means of limiting the number and duration of the attacks.

Diet is most important; the use of fats to take the place of bread and vegetables has proven helpful. Fasting would likely be a cure in many cases but, of course, that is impossible. I have spoken before of a case I kept free from attacks for over a year by simply washing out the stomach two or three times a week.

Cutting out a section of the large intestine stopped the attacks in fifty-five cases, but the attacks have returned in the majority of these cases.

So try to discover some cause. Try the fat diet. Do all you can for these sufferers.

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onds to one or two minutes, after which the patient passes into a clonic convulsion. During the clonic spasm the muscles contract and relax alternately, the jaw works convulsively, forming foam at the mouth, and often the tongue or lips are bitten, thus staining the foam with blood; the arms and legs go through a rhythmical contraction and relaxation, differing from that of hysteria, and the head may be rolled from side to side, or may be repeatedly struck against the floor.

This clonic spasm lasts for a few minutes, after which the patients falls into a profound sleep, the epileptic coma. The coma lasts about an hour and is followed by a severe headache, mental sluggishness and disordered thought. The patient will have no knowledge of what has transpired during the attack, and may not know that he has had an attack, unless in falling at the outset of the seizure he may have bruised his head or bitten his tongue. There may be mental dullness for two or three days following the attack, after which he regains his usual status.

The attack often comes on with a great deal of regularity and with varying frequency. In females they often appear at the time of the menstrual period. Several seizures may occur at a time with or without any intervening periods of consciousness.

Epilepsy usually begins between the ninth and twentieth years, and the great majority of cases begin at puberty, although irregular convulsions and other peculiarities may occur previously. When the attacks occur but a few times a year, as is often the case, the mental functions are not affected, but when recurring frequently the mentality may be greatly affected, there being mental dullness, slowness of thought, defective reasoning, poor memory, inability to concentrate, feeble-mindedness, and sometimes insanity. **Psychical epilepsy** is a form attended with maniacal excitement, violent temper and attempted crimes.

The *petit mal* is a form in which there is a temporary loss of consciousness, but is not attended with the convulsion.

This may come on suddenly without any premonitory warning while the patient is employed at work. He stops and stares, but does not fall, the features are fixed, the face is pale, the pupils are dilated, and there may be a slight twitching of the muscles of the face or an extremity. The attack usually lasts for but a few seconds, after which the patient will resume his work without any exhaustion, but conscious that something unusual has transpired. Some patients will have premonitory symptoms of a subjective character, and will sit down during the attack. The petit mal may occur in patients that suffer with the grand mal, or patients may have the petit mal without ever having a major attack.

There is no known reason for the regularity in the occurrence of the spells, but the following theory is offered:

The atlas subluxation impinging the nerve fibres leading to the lobes of the educated brain and preventing the normal transmission of innate mental impulses to that part of the brain; the result is abnormal metabolism. Wherever there is abnormal metabolism there is the formation and accumulation of poisons, and diminished molecular activity in the cells thus affected. It is noticeable that immediately preceding an attack the degree of mental dullness and inactivity increases until after the attack. Following the attack the patient becomes much brighter, and may be very alert mentally. Therefore it may be that this poison accumulates until the maximum of endurance is reached, at which time it is manifested in the epileptic convulsion. During the convulsion the poison is discharged from the brain and eliminated by the kidneys, the patient feeling well until more has accumulated. Some medical writers say there is a discharge of gray matter from the brain into the muscles during the attack.

The muscles are unusually rigid immediately after an attack, and more force is required in moving the vertebræ than during the intervals of coordination.

Migrane or Hemicrania

Definition.—A paroxysmal incoordination characterized by severe unilateral headache, disorders of vision, and bilious vomiting.

Adjustment.—This is caused by a combination of subluxations, including atlas and S. P.

Symptoms.—The paroxysm of headache may be preceded by malaise, a feeling of depression, heaviness over the eyes, and indigestion. The headache begins at the base of the skull, usually on the left side, and radiates upward and forward over the temporal and frontal regions. The pain may be confined to this one side, or may change to the opposite side, or become diffuse over both sides. The headache is intense and throbbing, and is increased in severity upon stooping, jarring or by hearing loud noises. The eyes are sensitive to light, and there may be a dimness of the visual field. There is nausea and vomiting, the vomitus consisting mostly of bile. The urine is highly concentrated, and may be high in acidity.

The attack may be of varying duration, from a few hours to several days. Severe cases may occur in which the headache is constant, and vomiting spells reappear each day.

Adjustments at atlas and S. P. readily correct the incoordination, and in cases in which there are other associated conditions, a local adjustment should be made. Disorders of the generative organs are most frequently associated, and the attack most frequently occurs in women during the menstrual periods. It is not infrequent that the incoordination is of sufficient severity to confine the patient in bed for one or more days.

Hysteria

Definition.—Hysteria is an incoordination of the brain, characterized by excitability, mental depression, and a loss of the emotional control.

Etiology.—Hysteria is caused by an atlas or axis subluxation. However, there may be associated conditions which

should be adjusted for locally. The principal of these is sexual disturbances, and the local adjustment is lower lumbar.

There are two forms of hysteria—major and minor, or severe and mild.

Symptoms of Hysteria Minor.—This occurs periodically, and is often induced upon unusual excitement. There may be headache, poor appetite, vomiting, and general hyperæsthesia, especially along the spine. The individual is very irritable and is easily offended. The attack often begins with laughter, crying or senseless talking, and is followed by the globus hystericus, or a sensation of a ball arising from the pit of the stomach to the throat. This produces a sensation of choking. The muscles are contracted, the eyes may be closed, and the patient may throw herself upon the floor struggling violently, although this latter symptom belongs to hysteria major. There is rapid changing of the mood, a craving for sympathy, and loss of the power of concentration.

Symptoms of Hysteria Major.—The major attacks are always preceded by the minor attacks, in which there is laughing and crying, cutaneous hyperæsthesia, globus hystericus, and often involuntary voiding of urine. This may be followed by the hysterical convulsion, in which the eyes are closed, the limbs are extended, the hands are closed, the patient may scream and pull her hair. The contractions and relaxations lack the rhythm found in epilepsy, because they are more or less intentional and controlled by the will. The patient is always offended if told this.

Very frequently paralysis is found in hysteria major, and usually is in the form of a monoplegia or a hemiplegia. In cases of hysterical hemiplegia the gait is peculiar, in that the affected leg is drawn up even with the other, and the advanced step is always made with the unaffected foot. There is a craving for sympathy, weakness of the will, lack of self control, constant thinking of self and enlarging upon personal discomfort. Following the convulsion the patient may pass into hysterical coma. This, however, is only partial, and the

patient may be aroused by firm pressure upon the supraorbital notches or by pinching the nose.

The respiration and pulse are normal during both the convulsion and coma, cyanosis does not occur, the lips do not foam, and the patient does not bite the tongue or lips.

Hystero-epilepsy is not epilepsy, but a form of hysteria major in which the convulsion resembles that of epilepsy.

Hysteria occurs most frequently in women, while neurasthenia is more common in men. The cardinal difference is that in hysteria sympathy is craved for, in neurasthenia sympathy is not desired. Hysterical patients are more often fleshy and plump, while neurasthenic patients are usually thin and emaciated.

Neurasthenia or Nervous Prostration

Definition.—This is also called the American disease, and is an incoordination of the brain system, characterized by various forms of bodily and mental inefficiency.

Etiology.—This is usually caused by an atlas subluxation, but may be in combination with local, especially in the lumbar region. It is very frequently the case that the generative organs are also affected, and sometimes a history of sexual excesses, mental strain or great emotion precedes the attack.

Symptoms.—Nervous prostration is more commonly found in men, and usually begins with persistent occipital headache, mental depression, inability to concentrate the mind, insomnia or sleeplessness and general irritability. There is a feeling of cranial constriction, as if a tight band were placed around the head, or the patient may complain of a pressure upon the vertex of the head. There is a feeling of spinal weakness; usually there is hyperæsthesia, or there may be perverted sensation with a feeling of formication. Ringing in the ears and dizziness is common; the sexual function is weakened or may be totally abolished, and there may be various cardiac and gastric neuroses. Palpitation is the most

common cardiac disturbance and hyperacidity of the gastric juice the most common digestive disturbance.

Among the sensory disturbances, those of the eyes are most common and pronounced, there being astigmatism or unequal refraction of light, myopia or short sightedness, and hypermetropia or far sightedness. There may be hyperacusis or dysacusis, and the sense of smell may be perverted.

When a history of injury precedes the onset of neurasthenia it is called traumatic neurosis or traumatic neurasthenia. The symptoms, however, are the same, consisting principally of spinal hyperæsthesia, muscular weakness; hypochondriasis, irritability, diminishing power of concentration, impaired function of the bladder and general bodily improvement. Shell shock is a form of traumatic neurasthenia.

Neurasthenia yields very rapidly to Chiropractic adjustments. Of the many cases on record, several have fully recovered after taking one week's adjustments. An extreme case fully recovered after forty adjustments, the adjustments being given two or three days apart. In the traumatic form there may be varying combinations of subluxations produced and the adjustments will have to be made accordingly.

Chorea or St. Vitus Dance

Definition.—A chronic incoordination characterized by irregular involuntary contraction of the muscles with varying degrees of excitability.

Etiology.—Chorea is usually caused by an atlas or axis subluxation, but when localized, as in the muscles of the neck, around the eyes or face, it may be caused by a local subluxation, as will be determined by vertebral palpation.

There is no localized pathology in chorea, and, as a rule, there is no nerve tracing, but tenderness of a diffuse character may be present. It is primarily an affection of the motor function, caused by pressure upon the motor nerves distributed to the muscles affected.

Symptoms.—Chorea is more commonly found in girls during childhood or about the age of puberty, but may be found at any age or in either sex. The onset is gradual and may be first noticed as a slight twitching of one or more muscles. Many cases begin with winking of the eyelids, twitching of the mouth when speaking, drawing of the neck muscles, or a jerking of the hand or arm. The muscular twitching may be confined to the muscles originally affected, but in most cases, if the affection is progressive in character, the contractions become evident in all the muscles of the face, neck, arm and leg, after which the opposite side is similarly affected. The twitching is increased in severity upon mental excitement, as when talking, especially to strangers, or when conscious of being watched. The speech is indistinct and confused, thoughts are flighty, concentration is poor, the intellect is dull, the temper is irritable and the muscles are weak and easily exhausted. The muscular movement subsides during sleep.

The heart's action is irregular, the appetite is poor and digestion is impaired, the result being emaciation and weakness. Constipation is present in nearly all cases, and in the more severe cases there may be mania and delirium. When the two latter symptoms are present it is called **maniacal chorea**.

Chorea usually occurs in attacks of five or six weeks' duration and may be repeated several times. Other cases may begin during early life and remain permanent. It is not uncommon in the ordinary severe case for the patient to be unable to feed himself, yet there may be no paralysis. Occasionally a monoplegia occurs, when it is called **paralytic chorea**. The patient may recover from the chorea and the monoplegia remain.

Chorea also yields very readily to the adjustments, several cases within my observation having recovered completely after one to four weeks' adjustments.

Habit Spasm is a name given to a mild form of chorea,

which is caused by an atlas subluxation and is characterized by a sudden quick contraction of the muscles of the face, neck or shoulders.

These muscular contractions may consist of a drawing of the mouth to one side, a shrugging of the shoulders, or a nodding of the head. The patient gets into the habit of going through these peculiar moves from time to time, and their extensiveness increases gradually until the condition is given this name.

Saltatory Spasm

Definition.—An incoordination of the muscles of the lower extremities in which there is a jumping or a springing movement.

Etiology.—This is caused by a subluxation of the lower lumbar, or may be caused by a cord impingement at the atlas.

Symptoms.—So long as the individual is sitting or lying and no weight is placed upon the feet no symptoms are noticed, but as soon as the patient arises the calf muscles suddenly contract so that the patient springs or jumps. The springing may be associated with screams or symptoms of mental instability.

Torticollis or Wryneck

Definition.—An incoordination in which there is a tonic spasm of the sterno-cleido-mastoid muscle, and sometimes of the upper part of the trapezius.

Adjustment.—This is caused by a local subluxation in the cervical region, which impinges the motor nerves leading to the muscles affected, and especially affecting the spinal portion of the spinal accessory nerve which is distributed to these two muscles.

Symptoms.—This may begin suddenly, with severe pain when movement is attempted, or gradually, with feelings of discomfort, pain in the neck, and slight spasms of the neck muscles. At first these spasms are clonic or intermittent.

Each spasm or attack is increased in duration until the contraction becomes tonic or constant, when all pain subsides. The head is drawn down toward the affected side, the chin is tilted upward and the face rotated toward the opposite side. The sterno-mastoid muscle on the affected side becomes hypertrophied and the opposite one atrophies because of nonuse.

This is sometimes called muscular rheumatism of the sterno-mastoid muscle. As a rule the facial muscles are not affected by the contraction, but occasionally there may be facial asymmetry. The adjustment releases the pressure upon the motor nerve and permits normal flow of innate motor impulses which restore normal tonicity to the contracted muscle.

Spasmus Nutans

Definition.—This is also called the **nodding spasm**, and is an incoordination of the muscles of the neck, characterized by a regular nodding movement of the head.

Etiology.—This is caused by an atlas subluxation, or may be caused by an M. C. P. subluxation. Determined by palpation.

Symptoms.—This disease begins with periodical attacks which may be violent and last for several minutes. The attacks are prolonged, and may last for hours or may be constant. The movements are of varying rapidity, being from 30 to 60 per minute. The eyes and face may be affected and the nodding movement may be from side to side or backward and forward.

Spasmodic Tic With Coprolalia

Definition.—An incoordination of the muscles of the body associated with mental instability, characterized by involuntary muscular contractions and indecent utterances.

Etiology.—Atlas subluxation.

Symptoms.—The incoordination makes its appearance in paroxysmal attacks, which are irregular in time of occurrence.

At first the head and the upper extremities alone are involved, but later the muscles of the major portion of the body become affected. The attack begins with a sudden contraction of the muscles of a part or all of the body, during which time the patient will jerk, jump, hiccough, bark, or go through movements similar to sneezing. During the attack the patient will make inarticulate utterances, or, if the words are articulate, are of an obscene or profane character. The utterances are made very rapidly, as are the muscular movements. This condition is most commonly met with in young boys, slightly before or at puberty.

Paralysis Agitans

Definition.—This is also called Parkinson's disease or shaking palsy, and is a chronic incoordination of the muscles, characterized by muscular weakness, tremor and flexor rigidity.

Adjustment.—Atlas or axis.

There is no known pathology and no definite nerve-tracing in shaking palsy. Most cases begin after the fortieth year of life.

Symptoms.—This usually begins with slight aching pains in the thumb and first two fingers of one hand, and a slight unsteadiness of the thumb of the affected hand, which soon develops into a tremor. Later the tremor starts in the fingers, and the characteristic "bread crumbling, or pill rolling" movement is noticed. The extent of the tremor increases so that the entire forearm trembles, and the tremor begins to be noticed on the hand of the opposite side. The legs, face, and neck muscles may become affected. There is a marked flexor rigidity affecting all the muscles of the body so that the patient always assumes a stooped position, the knees are bent, the forearms are flexed upon the arms, and the trunk leans forward.

The festination or propulsive gait is characteristic of this disease; in it the patient leans far forward, and it appears

that he is on the point of running or that his gait is increasing in speed and his steps are shuffling. It is difficult for him to stop quickly or to turn a corner, the voice becomes weak and high-pitched, the saliva is secreted in excess, and often dribbles from the mouth, and the patient is usually emotional.

The movement temporarily stops upon voluntary movement and during sleep. The patient is usually restless, and sleeps poorly. The general health may be fairly good, and life is not greatly shortened by the paralysis, but the patient may become entirely helpless.

The Occupation Neuroses

Definition.—An incoordination of the muscles of the thumb and first two or three fingers, in which they are subject to spasmodic contraction when brought into active use.

Adjustment and Nerve Tracing.—This is caused by a subluxation at A. P., and tenderness can be traced from the seventh and eighth intervertebral foramen over the shoulder and down the arm to the fingers affected.

Symptoms.—There are various forms of occupation neuroses, and other muscles than those of the hand may be affected. But the most common are writers' cramp and telegraphers' paralysis.

The onset is slow with slight stiffness and jerky movements when writing, or there may be numbness or prickling sensations. The degree of stiffness increases until it develops into a cramp. In writer's cramp the flexor muscles are affected so that upon prolonged writing the fingers and thumb close tightly in a tonic spasm, and movement ceases. In telegraphers' paralysis the extensor muscles are affected, and when the muscles are used for an unusual length of time the fingers straighten out in a tonic spasm so that the necessary movement in working is impossible.

This is an affection of the motor function caused by the A. P. subluxation impinging motor nerves leading to the mus-

cles of the hand. When the subluxation is properly adjusted the pressure is relieved, and the muscular function is restored to normal.

Tetany

Definition.—A muscular incoordination, characterized by bilateral tonic spasms of the extremities, which may be either paroxysmal or continued.

Adjustment.—The incoordination is caused by an atlas subluxation.

Symptoms.—This is also a motor disturbance and occurs gradually, with a contracting of the flexors of the arms and legs so that the arms are folded, the wrists are flexed, and the fingers are usually extended, but may have athetoid movements. The thumb is usually folded in the palm of the hand, the toes are adducted, and the foot is extended. The muscles of the face, back and abdomen are also sometimes affected. When the respiratory muscles are affected, breathing may be suppressed, and cyanosis will result. The contraction may be periodic or continuous. In the paroxysmal form the attack may last about two weeks, after which muscular coordination supervenes. In the continuous type the muscles are tonically contracted except during sleep, but still the muscles are constantly in motion. Late in the disease lockjaw may occur. In tetanus, trismus is an early symptom, in tetany the masseter muscle is the last to be involved. This is an important point in the differential analysis of these two affections. Tetanus is also an acute febrile disease, with high fever; frequently follows wounds, and is marked by contraction of the spinal muscles, cervical retraction and opisthotonus.

Raynaud's Disease

Definition.—A form of dry gangrene affecting the fingers and toes, characterized by coldness, numbness, and a waxy pallor.

Adjustment.—The adjustment should include K. P. with local, according to the extremities affected.

Pathology.—In the early stages there is a thickening and hardening of the walls of the terminal arteries and arterioles, and they may become occluded, thereby producing a condition of local asphyxia in the tissues supplied by the obstructed arteries. The result of this is dry gangrene. The digits affected become atrophied and undergo necrosis. This may also be due to a vasomotor spasm.

Symptoms.—This usually affects two or more fingers or toes, according to the extremities affected. The affected digits become cold, numb, and the skin becomes dry and shrunken, and they feel as if paralyzed. Later all the fingers become affected, the hand becomes discolored, the bones and tendons become prominent and the ends slough off as a result of the necrosis. In the more severe cases the hand may become swollen, blue, and an area of inflammation will be seen lying between the area of necrosis and the line of demarcation. The necrosis will not extend above the point of obstruction of the vessels, and will heal when this point is reached. Life is not shortened, as a rule, from the affection.

Erythromelalgia

Definition.—This is a neuralgia of the hands or feet, characterized by redness and a continuous burning pain. The term means a painful red extremity.

Etiology.—This is caused by a local subluxation impinging the nerves leading to the affected parts. If of the hands, the subluxation is at A. P., and if of the feet, is at the lower lumbar region, as will be determined by vertebral palpation.

Nerve Tracing.—Tenderness can be easily traced from the point of the local impingement along the course of the nerve to the affected part.

Symptoms.—The feet are most frequently affected by the pain, which is continuous and of a burning character, and located principally in the heel or ball of the foot. The affected part is swollen and red, due to the congestion of the blood vessels. As a rule, it is increased in severity at night, and can be

relieved by lying with the feet placed horizontally. Blisters and slight ulcerations may form upon the red and swollen area. This differs from plantar neuralgia, in that there are both swelling and redness, and pain is relieved upon lying down. In the neuralgia the pain is continuous.

Progressive Facial Hemiatrophy

Definition.—An incoordination characterized by progressive wasting of the bones and soft tissues of one side of the face.

Etiology.—The cause is located in the upper cervical region, principally the atlas, and K. P. may be included in the adjustment.

Pathology.—This is simple atrophy, first affecting the subcutaneous areolar tissue and later affecting the bones so that they may be decreased to two-thirds of their normal size. The fat in the orbit of the eye may entirely disappear.

Symptoms.—This disease begins very slowly and is first marked by patches of leucoderma, and a dryness and scaliness of the skin on one side of the face. The hair on this side may fall out in patches, the skin will begin to wrinkle and the subcutaneous tissue begins to waste away. The eye on the affected side becomes deeply sunken because of the atrophy of fat in which it is embodied, the inferior maxillary atrophies to two-thirds its normal size, the eyelids become narrow and insufficient to cover the eye, the pupil is dilated, and there is lack of sebum or sebaceous fluid secreted. Occasionally there is pain, and there may be slight spasm of the muscles of the face and those of mastication. The mouth is drawn to one side, and a distinct line of demarcation can be noticed between the affected and unaffected parts of the face.

Acromegaly

Definition.—This is also called the pituitary body disease and Marie's disease. It is an abnormal condition of the func-

tion of cellular growth, characterized by abnormal processes of growth, chiefly of the bones of the hands and face.

Adjustment.—Atlas.

Pathology.—It is supposed there is an incoordination of the pituitary body which affects its internal secretion, the result being an overgrowth of the bones of the hands and face, especially the inferior maxillary.

Symptoms.—The onset is very slow and gradual, the first changes being a dryness and roughness of the skin, with patches of leucoderma. The facial expression changes and the face becomes massive. The bones and the subcutaneous tissue of the face hypertrophy. The fingers become enlarged and give rise to the deformity known as "spade hand." The voice is altered, the sexual power is abolished, the tongue, lips and nose are thickened, the muscles are weakened, there may be polyuria, and the chest bulges anteriorly.

Neuralgia

Definition.—A painful condition of the nerves in which there is either a functional disturbance at their peripheries or a neuritis in their course. The adjustment for neuralgia is always local, depending upon the nerves affected.

Coccydynia

Definition.—A neuralgia affecting the lower sacral or coccygeal nerves.

Etiology.—This is usually caused by an anterior subluxation of the coccyx, but may be caused by a subluxation of the sacrum, ilium or lower lumbar.

Symptoms.—The onset is sudden, and is characterized by sharp, darting pains around the region of the coccyx. The pain is intermittent and may be brought on or increased in severity by sitting and walking. Upon palpation, tenderness can be traced radiating from the lower sacral foramen. The pain rapidly yields to adjustment of the coccyx or sacrum.

Tarsalgia

Definition.—This is a pain in the sole of the foot, produced by a relaxation of the plantar ligaments. Is also known as broken instep, flat foot, and policeman's disease.

Etiology.—This is caused by a lower lumbar subluxation impinging the nerves conveying the motor function to the plantar ligaments, so that they become relaxed, permitting a slight abnormality in the articulation of the metatarsal bones.

Symptoms.—The cardinal symptom of this condition is pain of a dull, aching character in the foot, present only while standing or walking, and relieved upon taking the weight of the body off the feet. It differs from plantar neuralgia in that the pain of the latter is paroxysmal and does not cease upon sitting or lying. There is no swelling nor redness.

Sciatica

Definition.—A neuralgia or neuritis of the sciatic nerve.

Etiology.—Sciatica is caused by a lower lumbar or sacroiliac subluxation.

Pathology.—There is usually an inflammation of the sheath of the sciatic nerve, which produces a swelling and hyperemia of the structures surrounding the nerve. The swollen sheath compresses the nerve and produces pain. In other cases there may be neuritis of the nerve. When the nerve substance is affected the pain is less and there is a considerable degree of paralysis, but when the sheath is affected the pain is great and the paralysis slight or absent.

Nerve Tracing.—The exact course of the sciatic nerve can readily be followed by nerve tracing, the tenderness being very great, and more severe at certain places, especially at the sciatic notch.

Symptoms.—The onset is sudden, with pain in the region of the hip, which radiates down the back of the thigh, and may extend up into the lumbar region. The pain may be dull and aching at first, but is extremely severe and lacerating at times,

especially when moved. The pain is usually greatest at the sacro-sciatic notch, and can be made extreme at this point by flexing the extended leg upon the pelvis. The gait is limping, and the patient leans toward the affected side in order to minimize the pain. The pelvis becomes tilted and an adaptative scoliosis occurs in the lumbar region. The muscles of the affected limb becomes atrophied, the skin is cold, and if the nerve substance is affected, there will be paralysis. A red streak may be noticeable running down the posterior surface of the thigh, along the course of the nerve. The affection is nearly always unilateral, and yields rapidly to Chiropractic adjustments.

Plantar Neuralgia

Definition.—A neuralgia limited to the terminal branches of the sciatic nerve distributed to the sole of the foot.

Adjustment.—Lower lumbar. Same as sciatica.

Symptoms.—Irregular pain, with slight swelling and redness, present when standing or sitting, is the cardinal symptom of this condition. The pain does not subside when the leg is placed in a horizontal position, as it does in erythromelalgia, and is the differential symptom between the two affections. The pain is sharp and darting, as in other neuralgias, not dull and aching as in tarsalgia. Walking is difficult. This disease often occurs as a part of sciatica, either preceding or following it.

Lumbo-Abdominal Neuralgia

Definition.—A neuralgia affecting the upper lumbar nerves, characterized by pain of the lower abdominal muscles.

Etiology.—This is caused by local subluxations in the upper four lumbar vertebræ, as determined by vertebral palpation and nerve tracing.

Symptoms.—The disease begins with sharp pain in the back, loins and buttocks. The pain radiates anteriorly over the abdominal muscles, usually of one side, to the hypogastric and inguinal regions.

Occasionally the pain extends down into the thigh muscles, and then is called meralgia. The course of the affected nerve is tender, and can be readily followed upon nerve tracing.

Cervico-Occipital Neuralgia

Definition.—A neuralgia affecting one or more of the upper four cervical nerves, and characterized by pain over the neck and head. The pain is usually unilateral, radiating outward from the occiput, over the back of the head, neck and toward the face. Tenderness is traceable, and vertebral palpation reveals the local subluxation, which is the causative agent.

Intercostal Neuralgia

Definition.—Pain localized in the spinal nerves distributed to the intercostal muscles.

Etiology.—This may be caused by a subluxation of any of the dorsal vertebræ, depending upon the location of the nerves affected. Usually the fifth, sixth and seventh dorsal nerves are affected, therefore would be caused by subluxations in the region of S. P.

Symptoms.—The onset is sudden, and the pain is sharp and stabbing. Tenderness is present at the point where the nerves emit from the spine, and they are traceable outward over the intercostal muscles. The pain is radiating and follows the course of the nerves to the anterior of the abdomen. This is usually unilateral, but may be bilateral. The muscles are tensed, but do not interfere with respiration; there is no fever and no effusion into the pleura, which distinguishes it from pleurisy.

Trifacial Neuralgia

Definition.—A neuralgia affecting the sensory division of the trigeminus or trifacial nerve.

Etiology.—The cause of trifacial neuralgia is a subluxation of the third or fourth cervical vertebra, which impinges

fibres having connection with this nerve. This, as well as the cause of other diseases, has been discovered and proven through experiment, and is a fact, not a theory, appreciated by many sufferers of the annoying incoordination.

Symptoms.—The trifacial nerve has three divisions, viz.: Ophthalmic, superior maxillary and inferior maxillary. The two first named branches are most frequently affected, and the condition is also known as *tic douloureux*, when associated with muscular twitching. It begins with sensitiveness in front of the ear, along the nose, at the supraorbital notch, or along the upper jaw. The parts are tender under pressure, and pain may be constant, but this pain is usually paroxysmal and intensely severe. The pain often manifests itself upon breathing cold air, opening the mouth unusually wide, yawning or blowing the nose, but may occur without any of the above events. It usually begins around the eye, or may shoot upward under the malar bone, and may extend backward as far as the occipital protuberance. There is excessive secretion of the lacrimal fluid, the conjunctiva may be red and painful, and herpes may form upon the eyelids and lips. Mastication and speaking are more or less hindered and painful, and there are spasmodic movements of the facial muscles.

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Reflexes

When the periphery of an afferent nerve is stimulated by stroking, pinching, tapping or striking the stimulus travels over this afferent nerve to the spinal cord or medulla. The motor cells receive the stimulus which excites their activity. These motor cells then send out a motor impulse along the efferent nerve to certain muscles supplied by the corresponding segments, causing them to involuntarily contract. This act is called reflex action. The reflex action occupies about one-tenth of a second. The elapse of time between the application of the stimulus and the performance of the muscle is appreciable to the eye.

The reflexes of diagnostic importance are the superficial or cutaneous and the deep or tendinous.

Superficial Reflexes

The superficial reflexes are tested by stroking the skin with the finger or a pointed stick such as a toothpick, or by pinching or pricking the skin.

The **conjunctival** reflex is produced by touching the cornea. The normal response is closure of the eyelids. Their failure to close would indicate disease in the pons, or injury of the facial nerve.

The **pharyngeal** and the **palatal** reflexes are elicited by touching the wall of the pharynx or the soft palate. Normally the pharynx responds by contracting and the soft palate by elevating. Failure to secure this reflex indicates disease in the medulla.

The **scapular** reflex is produced by stroking the skin along either side of the spine between the two scapulæ. The scapular muscles respond by contracting. Failure to secure this reaction may indicate disease of the spinal cord or of the spinal nerves between the fifth cervical and first dorsal.

The **epigastric** reflex is produced by stroking downward from the nipple. The response is a slight contraction of the muscle in the epigastric region. This reflex passes through the spinal cord from the fourth to the ninth dorsal vertebræ.

The **abdominal** reflex consists in a contraction of the abdominal muscles when the skin immediately below the costal margin is stroked downward. This reflex passes through the spinal cord between the eighth dorsal and second lumbar.

The **plantar** reflex is produced by stroking the sole of the foot from the heel forward. The great toe becomes plantar-flexed normally. This normal action is dependent upon the integrity of that part of the spinal cord between the third lumbar and the second sacral segment.

Gordon's reflex is produced by deep pressure over the

calf of the leg. It also normally produces dorsiflection of the great toe.

Oppenheim's reflex is produced by stroking downward along the inner side of the calf and produces dorsiflection of the great toe.

Of these superficial reflexes the plantar reflex is of greatest practical use. For best results the patient should be in the recumbent posture and the extremity partially flexed at the hip and knee. The sole of the foot should be gently stroked from the heel to the toe with a pencil or stick. In normal individuals the great toe will be flexed toward the sole of the foot, excepting in young children who have not yet learned to walk. If the great toe becomes dorsiflexed as in Gordon's reflex and in Oppenheim's reflex, it indicates pathology in the pyramidal tracts of the spinal cord. Dorsiflexion of the great toe, when the sole of the foot is stroked is known as **Babinski's reflex**, or **Babinski's sign**.

The Deep Reflexes

Jaw jerk or the jaw reflex is produced by tapping the lower jaw with the mouth half open. The tapping may be done with the finger. The normal response is that the jaw closes. This action is dependent upon a normal motor nucleus of the trifacial in the pons.

The **triceps reflex** is produced by extending the arm from the body with the forearm hanging downward. The patient's arm should be supported under the elbow by the forearm of the examiner. In this position tap the triceps tendon and normally the triceps muscle contracts and extends the forearm. This reaction is dependent upon the integrity of the fifth, sixth and seventh cervical nerves, and that portion of the spinal cord from which they arise.

The **wrist reflex** is produced by tapping the flexor tendon at the wrist. In response the fingers are slightly flexed. This result depends upon the normality of the sixth cervical

to the first dorsal nerves, and the spinal cord from which they arise.

Knee jerk is also known as the patellar reflex. It is the most important of the deep reflexes. To elicit this reflex the knees should be crossed and the leg hang down in a relaxed condition. If the patient is in bed the leg may be supported by the forearm of the examiner placed in the crook of the knees which will allow the leg to swing on his forearm. The patient's attention should be diverted from the test. The Patellar tendon should be tapped between the patella and the tubercle of the tibia. Under normal conditions there is an abrupt jerk of the leg, or kicking forward with the foot. This response is secured in fully 98 per cent of well people. Diminished knee jerk may indicate nothing more than diminished nervous energy in tired-out people. The chief organic causes for diminished knee jerk are degenerative changes in the posterior columns, the posterior horns and the anterior horns of the spinal cord. Exaggerated knee jerk often occurs in the early stages of neurasthenia and in highly nervous people during mental stress. Its chief organic causes are pathology in the pyramidal tracts of the spinal cord, or in the motor area of the brain. When due to brain lesions the exaggeration is usually limited to the side of the body affected, which is, opposite the side of the brain having the lesion. When exaggerated knee jerk is bilateral, its cause is usually in the lateral columns of the spinal cord. Exceptions to this are found in infantile cerebral palsy, cerebral ataxia, and general paralysis of the insane.

Ankle jerk has about the same diagnostic importance as knee jerk. To test the ankle jerk extend the patient's leg and take hold of the foot, bending it upward to stretch the tendon Achilles. Then strike the tendon and the result is a contraction of the calf muscles which causes plantar flexion of the foot. If, when the tendon is struck, the calf muscles undergo a rhythmic contraction or series of contractions, the reflex is called ankle clonus. In other words, ankle clonus is

an abnormal ankle jerk or ankle reflex. This may also be detected by forcefully flexing the foot toward the leg; the calf muscles will then undergo a series of rhythmic contractions. Excessive ankle jerk and ankle clonus are found in the same diseases having exaggerated knee jerk—chiefly affections of the lateral columns of the spinal cord and the motor area of the brain.

Multiple Neuritis

Definition.—Neuritis is an inflammation of a nerve. Multiple neuritis, which is also known as peripheral neuritis, is an inflammation involving many nerves.

Etiology.—Neuritis, like neuralgia, may be caused by a local subluxation, but when many nerves are involved it is usually due to a cord impingement at the atlas. C. P. and K. P. should be adjusted during the initial stages, when fever is present.

Pathology.—The excessive heat in the nerve produces hyperemia of its blood vessels and a slow vascular exudation of serum into the nerve substance, making it soft and resembling thick cream. As the inflammation is prolonged the fluid is dried up, the nerve atrophies and the connective tissue is thickened, giving rise to sclerosis. This change is called degeneration or depletion of the nerve. As a result of this depleted condition of the nerve it is unable to carry on its function of transmitting mental impulses, so that the muscles to which the depleted nerve is distributed suffer and become paralyzed. The paralysis is flaccid in character.

The adjustment restores normal transmission of heat impulses to the affected nerve, the inflammation subsides, and depletion undergoes a process of reparation in which the nerve structure is repaired and restored to normal function.

Symptoms.—This may begin with a slight fever of 101 to 103 degrees, but is usually ushered in with numbness, pains and general weakness in the parts affected, which are usually the lower extremities; however, both lower and upper extrem-

ities may be affected. The pain, tenderness and muscular weakness steadily increase, so that walking may become impossible. The anterior tibial nerve is especially affected in the lower extremities, thus giving rise to the foot drop, and consequently the steppage gait, as in infantile paralysis. When the upper extremities are affected the inflammation usually is located in the musculo-spiral and its branches, and gives rise to the wrist drop. Pain and tenderness exist, though there may be complete muscular paralysis, and this in itself is an important differential symptom from infantile paralysis and transverse myelitis. This results in a flaccid paralysis, with much muscular atrophy. Sensory nerves may be affected by the inflammation at the same time, and this would cause pain, numbness, and finally tactile anæsthesia. The various sensory disturbances met with are pain, hyperæsthesia, tenderness, burning sensations, paræsthesia, numbness and anæsthesia. The reaction of degeneration may be noticeable very early in this disease, and indicates that the nerve substance has completely atrophied or is completely depleted, and is replaced by connective tissue, which presses upon the remains of the nerve substance. The reaction of degeneration is frequently written as De R. or R. D.

In infantile paralysis the onset is always sudden, with fever and a rapidly developing paraplegia, without much pain, or pain lasting but a short time. In infantile paralysis there is partial recovery, the continued paralysis being confined to one extremity, and that more often the right leg. Multiple neuritis is characterized by continued pain and tenderness, is usually bilateral, and more frequently affects adults.

Symmetrical Spontaneous Ulnar Neuritis

Definition.—An acute inflammation affecting both ulnar nerves, characterized by pain, paralysis and atrophy.

Etiology.—This is caused by a local subluxation at A. P. as will be determined by vertebral palpation and nerve tracing. Nerve tracing reveals tenderness emitting from the seventh

or eighth intervertebral foramen, extending outward over the shoulder and down the arm over the course of the nerves affected. Tenderness is very marked in this affection, and but slight pressure is required to produce tenderness.

Pathology.—There is inflammation of the ulnar nerve, the excessive heat producing relaxation of muscular fibres forming the vessel walls, and permitting hyperemia. Exudation of serum occurs from the congested vessels, causing a softening of the nerve substance. The entire nerve is red and swollen. If the inflammation is acute and soon subsides, the structure of the nerve will be but little affected, but if the inflammation is continued or prolonged, the nervous tissue undergoes atrophy and the connective tissue hypertrophies, replacing the degenerated nerve ailments.

Symptoms.—The onset is sudden, with pain, which may be moderate or severe, extending along the course of the affected nerves, and may be localized in a part of the nerve, or along its entire course. With the pain there may be numbness, burning sensations, tingling sensations, muscular weakness, and coldness of the arm and hand. These sensations may be increased in severity when the extremity is exposed to the cold, or when brought into contact with metallic substances. Later there may be inability to hold articles.

This differs from neuralgia in that tenderness is more pronounced, there is weakness and atrophy, both of which are absent in neuralgia.

Acute Ascending Paralysis

Definition.—An ascending flaccid paralysis beginning in the feet and rapidly extending upward, involving the trunk, arms and muscles of respiration in the order named.

This is also called acute creeping paralysis and Landry's paralysis.

Etiology.—An atlas subluxation is the most important factor in the cause of acute ascending paralysis, but the local zone in which the paralysis begins should not be overlooked.

It is possible that it could be caused by a cord impingement anywhere in the spine.

There is no nerve tracing in this condition.

Symptoms.—Weakness in the feet and legs is the first symptom to attract the attention of the patient. This weakness extends rapidly, affecting both lower extremities. There is malaise, general prostration, and, possibly, a slight fever. After both legs become affected the spinal muscles become weak, and paralysis becomes manifest in the arms and neck. Swallowing may become difficult, mastication impossible, and the facial expression may be changed with change in the emotions. Later the respiratory muscles are involved, with dyspnoea, cyanosis and suboxidation of the tissues. The sensory function is not affected as a rule, and death may occur in from one to four weeks.

There is a chronic form which begins with a slight degree of numbness in one foot, the numbness gradually extending upward to the knee, at which time the other foot becomes similarly affected. Walking becomes impossible, the girdle sensation is severe at times, and rectal and vesical anæsthesia are present, with retention of urine and constipation. The duration may be two or three years, death occurring when the paralysis involves the respiratory muscles and the heart.

Pseudo-Hypertrophic Muscular Paralysis

Definition.—A condition in which there is a decrease in the amount of power of the muscles, but an increase in their size.

Adjustment.—At., and K. P.

Pathology.—The muscles become very bulky, but diminished in contractile power. The muscle substance is displaced by fat and connective tissue, and there is an infiltration of adipose tissue between the muscular fibres.

Symptoms.—The earliest symptom is the waddling gait, with muscular weakness and a marked tendency to stumble and fall. The muscles of the calf of the leg and the buttocks

are greatly enlarged, while the spinal muscles and the muscles around the scapula undergo atrophy. Because of the atrophy of the spinal muscles there is a lordosis in the lumbar region of the spine. In walking the pelvis is tilted by a swinging of the body while the foot is pushed forward. Upon palpation the muscles feel hard and nonelastic. Sometimes the tongue becomes thick and hypertrophied. There may be great difficulty in walking and going upstairs. The reflexes are diminished or absent. Deformities of the feet frequently occur when affecting the young. Upon arising from the recumbent position the patient first arises upon all fours, straightening the knees and then raising the trunk. The duration is indefinite, and life may not be shortened by the paralysis.

THE SPINAL CORD

The spinal cord is an organ of conduction. It conducts impulses from the brain to the spinal nerves and ganglia, and it conducts impressions from the afferent nerves to the brain. It can only perform its work well when it is in a healthy condition itself. To be healthy it must be properly nourished, kept at the proper temperature, its vessels must maintain the proper degree of tension, and it must be normally sensitive. Each spinal nerve gives off a branch called the recurrent meningeal which innervates the spinal cord with functional impulses that serve to keep it in a normal healthy state. Impingement of the recurrent meningeal nerve will interfere with that segment of the spinal cord supplied by the impinged nerve. If the fibre impinged be a vaso-motor fibre anemia or hyperemia of the cord may be produced. If the impinged fibres carry calorific impulses the spinal cord may become inflamed. If the fibres impinged carry trophic impulses the spinal cord substance may undergo degeneration, and if the fibres impinged be sensory in nature the sensitiveness of the spinal cord would become abnormal.

Disordered function of the spinal cord will be manifested in portions of the body supplied by the portion of the spinal

cord that is diseased. The nature of spinal cord diseases also depend upon the function of the tract or nerve path whose function has been altered by the impingement, thus it will be seen that a great variety of diseases may be produced by involving different centers, tracts of fibres or combinations of these.

The cortex of the spinal cord is composed of fibres, while its medullary portion is composed of cells. The medullary portion is gray in color and is therefore called the gray matter. The gray matter is arranged into two anterior and two posterior horns. There are four functional centers in the anterior horns, namely: motor, vaso-motor, secretory and trophic. Degeneration in the anterior horn at a given level will naturally disturb those functions carried by the portion of the anterior horn having undergone degeneration. In infantile paralysis it is common to note loss of the power to move, atrophy, cyanosis, and dryness of the skin. All of these symptoms would indicate involvement of all four functional centers in the anterior horns. In a case having loss of motive power, only, there would be no indication of involvement of the vaso-motor, trophic or secretory centers, yet the loss of motive power together with symptoms indicating pathology in the spinal cord would indicate alteration in the structure of this motor pathway. Diseases affecting the anterior horns of the spinal cord may involve any combination of these four functions. When the motive function is affected the paralysis will always be flaccid, and the knee jerk will be diminished or lost.

The posterior horns of the spinal cord together with the column of Goll and the column of Burdach are sensory in nature. These tracts also have four functional centers, namely: tactile, temperature, pain and muscular or knee joint sense. Disease of the posterior columns of the spinal cord may affect any or all of these functional centers, thus in transverse myelitis there is a complete loss of tactile, temperature, pain and muscular sense, but in locomotor ataxia at

an early stage there may be a disturbance of only the muscular or knee joint sense. This is the sense which is used in judging weight, direction and position. It is used in retaining the equilibrium, hence the positive Romberg sign in ataxia, because the patient is unable to use the eyes to supplement this sense. Pathology in the posterior horns and columns does not involve motor, trophic nor secretory functions. Interference in locomotion is due to the disturbance of the sensory function only. Diseases affecting the posterior columns have lost reflexes and awkward movement.

The lateral columns of the spinal cord known as the crossed pyramidal tracts is the chief motor tract from the brain. It is composed of white fibres. When these fibres are damaged by morbid changes the power of locomotion is disturbed. Disease in these columns causes the reflexes to be exaggerated and produces rigidity of the exterior muscles. There being no trophic, secretory nor vaso-motor fibres in the crossed pyramidal tract explains the absence of atrophy, coldness and dryness of the skin in affections of the lateral columns.

The extent of a permanent paralysis due to disease of the spinal cord depends upon the area of the cord permanently damaged by that disease. It does not depend upon the entire area involved by the disease at its onset. Infantile paralysis gives an excellent example of this fact. During the acute stage in this disease the area of inflammation may extend far beyond the area in which the inflammation is centralized. The hyperemia and edema in that acute stage may involve remote parts of the anterior horn, and during its existence prevent function of those remote parts. As the inflammation subsides this hyperemia and edema lessens. The intra-neural pressure is then removed from the more remote parts of the anterior horn and function reestablished. That portion of the anterior horn in which the inflammation was centralized will be damaged most and those muscles supplied by this particular part of the spinal cord will remain paralyzed. This explains the

gradual improvement during the subacute and chronic stages of this disease.

Acute Anterior Poliomyelitis

Definition.—An acute inflammation of the anterior horns of the gray matter of the spinal cord, characterized by fever, flaccid paralysis and atrophy. This is also called **infantile paralysis**, **infantile palsy**, and **myelitis of the anterior horns of the spinal cord**. It is called **infantile** because it most frequently occurs in children during the first four years of life, but may affect adults as well.

Etiology.—Infantile paralysis is caused by a vertebral subluxation, usually the atlas, but may be located anywhere in the spine, which impinges either the spinal cord or nerves leading to it, and thus produces an inflammation of the anterior horns of the gray matter.

Pathology.—The inflammation of the anterior horns of the gray matter of the spinal cord produces a relaxation of the muscular fibres composing the blood vessel walls, thus permitting hyperemia, with a vascular exudation of serum into the nerve substance, making it soft and greatly swollen. Prolonged excessive heat in this location finally results in a drying and hardening of the nerve substance, and a proliferation of the connective tissue elements. The hypertrophied connective tissue, when it contracts, presses upon the nervous tissue and replaces it. The final condition being termed sclerosis. The degenerative state may exist anywhere in the spinal cord, but the usual location is in the dorso-lumbar enlargement. However, there are many cases in which it is located in the cervical enlargement of the cord.

There is no nerve tracing in a case of poliomyelitis, as the pathological condition lies within the neural canal of the spine.

Symptoms.—The disease begins suddenly, with spinal aching, malaise, and a fever of 100 to 102 degrees. The fever lasts from two to five days, during which time the skin is

dry and hot, the tongue may be coated, the urine is scanty and highly-colored, the bowels are constipated, but occasionally there is diarrhoea, the appetite is poor, and vomiting may be present. Within a few days it will be noticed that the lower limbs are paralyzed, or possibly all four extremities, depending upon the part of the cord affected. As a rule, the bladder and rectum are not affected, and there is no anæsthesia, or, if present, is only temporary. During the first few days there is more or less spinal pain radiating into the legs. This is a flaccid paralysis, and is more noticeable in the muscles below the knee than in those of the thigh; and the anterior tibial muscles are especially affected, permitting the characteristic foot drop, so common to infantile paralysis. The affected extremities rapidly undergo atrophy or wasting, making the leg long and slender. The paralysis may subside or partially recover in the extremities least affected, leaving the one extremity totally paralyzed. This is usually the right leg. It fails to grow and usually becomes deformed, the child becoming club-footed; any of the forms of talipes developing.

If the leg should only be partially paralyzed, or if the child should wear a brace in walking, a lateral curvature of the spine with a tilting of the pelvis will develop, because the affected limb will be shorter than the one on the unaffected side. This curvature is usually located in the lumbar region and is purely adaptative. All that is required to remove such a curvature is to give a specific adjustment that will remove the paralysis and restore normal function to the legs. When in the sitting position the spine will straighten out, unless there should be ankylosis.

Infantile paralysis differs from myelitis, in that the sensory function is not involved, there are no bed sores, there is no vesical nor rectal anæsthesia, there is no girdle sensation, and the condition is usually unilateral.

It differs from peripheral neuritis in that persistent pain and tenderness is absent, is unilateral, while multiple neuritis is bilateral, and the De R. appears late in infantile paralysis,

while it appears early in neuritis. Atrophy occurs more rapidly and to greater extent in infantile paralysis than in neuritis.

Restoration under Chiropractic adjustments is astonishingly rapid when given in the acute or early stages. Cases of long standing yield more slowly, as would be expected.

Progressive Muscular Atrophy

Definition.—A chronic incoordination in which the muscles become so greatly atrophied that they cannot perform their normal function.

Etiology.—Upper cervical subluxation. Also adjust K. P.

Pathology.—The muscle decreases in bulk and elasticity. This is the result of atrophy of the muscular elements and an increase of the connective tissue elements.

Changes also occur in the spinal cord, and consist principally of a partial sclerosis of the anterior horns and the anterior nerve roots. In this, as in other sclerosis, the nerve elements are destroyed and replaced by a hyperplasia of the neuroglia or connective tissue, making the spinal cord hard and unable to properly perform its normal function of transmitting impulses and impressions from and to the brain.

Symptoms.—The onset is very slow, and when apparent, progresses slowly and gradually. This first noticeable symptom is a slight atrophy of the muscles of the hand, especially those of the thumb, causing a deformity known as the ape-hand, later becoming the claw-hand. This atrophy may be associated with slight pains, numbness and tingling, but sensation is not lost. The atrophy increases, involving the entire hand and forearm, after which it appears in the other hand and forearm. The motion of the fingers and arm are affected by this atrophy so that the hand cannot be flexed upon the wrist, nor can the fingers be properly extended.

The atrophy next appears in the muscles of the shoulders, extending from here to the deep muscles of the spine, so that it is difficult to walk or stoop and retain the equilibrium.

Later the muscles of the thigh and leg are affected, and finally all the muscles of the body may be involved, except those of mastication and of the eyeball.

From the beginning there is some paralysis, the degree of which corresponds to the degree of the atrophy. There may be muscular twitching, consisting of wave-like movements of the muscles and skin. The sexual function is usually lost, and there is diarrhoea in most all cases. The skin is clammy, scaly, and may be more or less covered with sweat. There is often local areas of congestion or hyperemia.

Glosso-Labio-Laryngeal Paralysis

Definition.—A paralysis of the tongue, lips and laryngeal muscles, sometimes involving the eyelids, face and neck muscles.

Etiology.—This is caused by subluxations at atlas, lower cervical or S. P. regions of the spine.

Pathology.—In many cases no pathological condition exists other than that found in the affected muscles, which may become atrophied. Aside from these cases the pathological condition exists in the medulla, and for this reason is sometimes called bulbar paralysis. Certain tracts of the medulla undergo degeneration and sclerosis, which may extend into the roots of the nerves supplying the muscles paralyzed.

Symptoms.—The onset is usually gradual, but a few cases occur suddenly when due to apoplexy of the medulla. At first there is difficulty in articulation, especially of the linguals, such as l, t, d, and r, the difficulty steadily increasing. With this there is difficulty in chewing and swallowing, as the tongue fails to properly place the food between the teeth to be masticated, and is unable to push the bolus backward so that the pharyngeal muscles can complete the act. Next, the lips become paralyzed and speech is still more indistinct, the mouth remains open, the saliva dribbles from the mouth, swallowing is difficult, solid food is eaten with great difficulty,

the facial expression of the lower part of the face does not change with a change of the emotions, the sense of taste is lost, the throat is dry and stiff, the voice becomes nasal in character, fluids regurgitate through the nose in the attempt to swallow, and the ability to produce voice is greatly diminished. When the eyelids are affected the eyes remain open and the conjunctiva may become red and inflamed. Occasionally the neck and arms are involved, and the affected muscles become atrophied.

Progressive Ophthalmoplegia

Definition.—A chronic form of paralysis, progressive in character, in which the muscles of the eyeball are involved.

Etiology.—This is caused by a subluxation in the upper cervical region.

Pathology.—This paralysis usually affects the two internal recti muscles and the levator palpebræ superioris. The affected muscles lose their tonicity, become thin and stretched, due to the lack of motor expression.

Symptoms.—The onset is very gradual, the first symptom being a limitation in the movability of the eyeball in watching moving objects. Following this it will be noticed that a slight strabismus has developed, which is of the divergent form, due to the tension of the unaffected external recti muscles. There is diplopia or double vision, a drooping of the eyelids, and a peculiar expression of the face known as Hutchinson's face. As a rule, vision is not impaired, but may be interfered with by the ptosis of the eyelids.

Amyotrophic Lateral Sclerosis

Definition.—A sclerosis of the lateral columns of the spinal cord, characterized by paralysis and atrophy of certain muscles. Also called Charcot's disease.

Adjustment.—Upper cervical region.

Pathology.—The inflammation is chronic in character, and lies in the white matter and in the lateral columns. The blood vessels become hyperemic, and a slow vascular exudation results. The effect of the prolonged excessive heat is such that the nerve substance becomes dried and hard, the connective tissue proliferates and replaces the nervous tissue, and the function of the cord is impaired. The inflammation may be located in any portion of the cord.

Symptoms.—This begins with a sensation of weariness and heaviness in the legs, progressing until a paraplegia is reached, or it may begin in the arms. Since the sclerosis is more frequently located in the cervical part of the cord, the first symptoms usually appear in the arms. The muscles become more rigid or spastic as the paralysis increases. If walking is possible, the spastic gait is present, the patient walking by tilting the pelvis while pushing one foot forward, the toes drag on the ground, and the patient has a tendency to fall forward. The arms are involved by the paralysis, they becoming stiff and atrophied. The tongue becomes stiff and numb, swallowing is difficult, chewing is impossible, and the patient becomes entirely helpless. The knee jerk is exaggerated and sensation is not affected.

Myelitis

Definition.—An inflammation of the substance of the spinal cord, characterized by deep-seated, burning pain and muscular paralysis.

Adjustment.—Atlas, (C. P. and K. P. when acute) or local.

Pathology.—The excessive heat in the substance of the cord produces hyperemia and exudation, making the nervous tissue soft and creamy. Prolonged heat causes drying and hardening of the nerve tissue, proliferation of the connective tissue so that it presses upon and replaces the nerve substance. It may be localized in any portion of the cord, but usually in the dorso-lumbar enlargement.

Symptoms.—When the gray matter alone is affected it is called central myelitis; when the white matter alone is affected it is called cortical myelitis, and when both gray and white matter are affected it is called transverse myelitis.

Transverse myelitis is the most common variety, and usually begins with deep-seated spinal pain, aching in the legs and feet, general muscular weakness, and a slight fever of about 103 degrees. The patient complains of a feeling of needles and pins, formication, hyperesthesia along the spine, and a sense of constriction around the legs or trunk opposite the site of the degeneration. This latter symptom is also called the girdle sensation.

The fever lasts but a few days, during which the paralysis develops and may become complete within three or four days. This paralysis is usually a paraplegia, but may also affect the arms, depending upon the part of the spinal cord affected. In transverse myelitis both the sensory and motor functions are affected, producing tactile anesthesia as well as muscular paralysis. There is rectal and vesical anesthesia, thus retention of urine and constipation. Atrophy may be present, as the nutritive nerves are affected, but often the muscles retain a good size and are spastic. Bed sores and sloughs form upon the parts coming in contact with the bed, and may appear as early as the second or third week. The reaction of degeneration is present in those cases in which the process of depletion or sclerosis is complete. This occurs when the nervous tissue in the spinal cord atrophies and is pressed upon by the hypertrophied connective tissue. There are cases that partially recover of their own accord, and the characterized by a spastic gait, tenderness, pain, and burning sensations in the extremities affected. If the degeneration is great in the cord and respiratory muscles and the upper extremities are affected, dyspnoea, dysphagia and irregularity of the heart's action may be more or less present.

Acute transverse myelitis differs from multiple neuritis and infantile paralysis in that both motor and sensory paral-

ysis exists, the paralysis is spastic, there is rectal and vesical anæsthesia, girdle sensation, decubitus occurring early and with pain only at the onset.

Chronic Myelitis

Definition.—A prolongation or continuation of the acute form, or may be a slow hardening of the spinal cord from a chronic inflammation.

Adjustment.—Atlas or local.

Pathology.—The pathology of chronic myelitis is identical with that of the acute form except that it may occur more slowly and have less exudation of serum into the substance of the cord.

Symptoms.—If a prolongation of the acute attack, the symptoms are as described in the previous topic. If due to a slowly progressing inflammation, the onset is gradual with a feeling of weakness and heaviness in the legs and feet. The legs may ache and tire easily. There is numbness and prickling sensations, the girdle sensation is present, the legs stiffen, the spastic gait is present, the girdle sensation is annoying, there is slight pain in the spinal region, the sphincters of the bladder and rectum are affected, and atrophy finally occurs. This atrophy affects principally the connective tissues, as the muscles may remain fairly well developed. The patient may finally become bedridden, and have sloughing bed sores. Sensory paralysis is as complete as in the motor.

Spina Bifida

Definition.—An incoordination of the spine in which the posterior arch of the neural canal fails to ossify, and is characterized by a protrusion of the meninges of the spinal cord with the accumulation of serum.

Adjustment.—Atlas or a cord pressure locally above the cleft in the spine.

Pathology.—There are three pathological conditions in spina bifida, viz. : meningocele, meningo-myelocoele and syringo-

myelocoele. In all forms the lamina fail to unite to form the spinous process, thus leaving the posterior surface of the spinal cord unprotected by bone. This cleft condition of the spine usually affects the lower lumbar and upper sacral segments.

In **meningocele**, which is the most common condition, there is a protrusion of the meninges, consisting of one or more of its layers and containing serum, varying in size from one to six inches in diameter.

In **meningo-myelocoele** there is a protrusion of the spinal cord and the meninges. The palpable tumor is much less in size than the simple meningocele.

In **syringo-myelocoele** the posterior half of the cord protrudes with the meninges to form the tumor, and the central canal of the cord is dilated, containing the serum. This is also small in size, and is uncommon.

Symptoms.—The development of the tumor is slow, and no symptoms may be observable until it attains sufficient size to attract the attention of the patient, or until it is capable of producing symptoms. The child fails to grow in size and strength as it ordinarily should, and is usually undeveloped mentally. The tumor can be seen upon inspection; the skin over the tumor is glossy and tense, a kyphosis develops, the patient walks in a stooped posture, the region of the lower spine is very tender upon palpation, and finally a paraplegia develops. Most cases having either of the three above named pathological conditions die before reaching the twentieth year.

Spinal Meningeal Hemorrhage

Definition.—A hemorrhage or oozing of blood from the capillaries into the meninges of the spinal cord.

Adjustment.—Atlas or local.

Pathology.—The hemorrhage may be the result of trauma-time, as in fracture of the skull, in which case there is an accumulation of blood between the dura mater and the cranial bones. It may occur spontaneously when there is a lack of

motor function being expressed in the muscular fibres forming the vessel walls. The vessel walls become greatly relaxed, prolapsed and their fibres separate, allowing the escape of blood into the meningeal spaces.

Symptoms.—The symptoms will vary with the size and location of the hemorrhage. The onset is sudden, with severe pain in the spine and great tenderness along the course of the superficial nerves arising from the part of the cord affected. There is numbness and tingling, which, together with the pain, radiate downward to the lower extremities. Hyperesthesia becomes general below the point of hemorrhage and there is muscular incoordination, consisting of twitching, spasms or paralysis. The height of the symptoms of the hemorrhage is reached within a few hours and then partially subsides. The final result is a partial paralysis.

If the hemorrhage is in the cerebral meninges there is hemiplegia, with delirium, stupor, convulsions, impaired function of the pupils, and if large, will terminate with symptoms of collapse and death.

Hematomyelia

Definition.—Also known as apoplexy of the spinal cord, is a hemorrhage occurring suddenly into the substance of the spinal cord.

Adjustment.—Atlas or local.

Pathology.—The vertebral subluxation produces pressure upon nerves conveying the motor function to the minute muscular fibres forming the blood vessel walls, causing them to lose their tonicity and relax. The degree of relaxation is so great that the fibres become slightly separated, permitting the blood to ooze between the fibres into the cord substance. The pressure produced upon the delicate nervous tissue of the cord by the effused blood is sufficient to prevent normal function, and gives rise to the following symptoms:

Symptoms.—The onset is sudden, with pain, numbness, and tingling throughout the course of the nerves radiating

from the point of hemorrhage. The pain may be severe and acute at the onset, but gradually lessens as the hemorrhage increases, while paralysis becomes more pronounced and may become complete within a short time. The paralysis is usually motor, but may also be sensory, and if the hemorrhage occurs in the dorsal or lumbar cord no further symptoms may arise. If the hemorrhage should occur in the cervical cord the paralysis may be in the form of a hemiplegia, affecting the face, arms, and legs. There may be a transitory loss of consciousness or apoplectic coma. Soon the sensory disturbances subside, especially the pain, and a motor paralysis results. The paralysis is more severe than in meningeal hemorrhage, and the pain is less.

Tumor of the Spinal Cord

Definition.—An excessive accumulation of tissue cells upon the spinal cord or its membranes within the neural canal.

Adjustment.—Atlas or axis, with K. P.

Pathology.—This may be a simple tumor or it may be malignant, either carcinoma, sarcoma or a glioma. Sometimes the tumor consists of gummatous material the product of syphilitic degeneration, and called a gumma. Gumma and glioma occur more frequently, undergoing degeneration and pressing upon the cord, having the same effect as a cord pressure.

Symptoms.—The symptoms are the same as a cord impingement at the point where the tumor is located, and will vary with the location of the tumor. A severe pain located in the spinal region at the point of pressure is a continuous symptom during the early stages. Later the girdle sensation develops, and is very annoying to the patient. There is hyperesthesia over a region opposite to the pressure and anesthesia below. One side alone may be affected or both sides may be unequally affected, depending upon the location of the tumor and the manner in which it constricts the cord. Paralysis always develops, usually progressing slowly in proportion to the rapidity of the growth of the tumor. If the tumor is

located in the cervical or upper portion of the cord the face, arms, larynx and thorax will be affected. Brown-Sequard paralysis sometimes occurs.

The adjustment at the atlas will stop further growth and development of cells, and will start a process of reparation in the part affected, in which a slow disintegration of the cells will occur. The adjustment at K. P. will assist the elimination of the waste material which is absorbed from the destroyed growth.

Syringomyelia

Definition.—An incoordination in which there is the formation of cavities in the spinal cord, characterized by paralysis, atrophy, and insensibility to pain.

Adjustment.—Atlas or axis.

Pathology.—There is presence of one or more tubular cavities extending from the central canal into the substance of the spinal cord. This occurs in the cervical portion of the cord, and is believed to be the result of improper closure of the posterior division of the canal during early life, which would be caused by the atlas subluxation. The name syringomyelia is taken from syrxinx, meaning tube, and myelos, meaning marrow; hence a tube or cavity in the marrow or spinal cord.

Symptoms.—The onset is very gradual, with aching pains in the neck and arms, followed by weakness and atrophy of the muscles. The pain, however, soon subsides, after which the sense of pain, heat, and cold is lost. Although there is anesthesia to temperature and to pain, still tactile sensation is retained. The affection is usually bilateral, and extends from the arms, hands, and neck to the spinal muscles, and spinal curvatures develop as a result of the muscular weakness. The skin is dry, in some cases sweaty and clammy; the hands are red, and skin eruptions may occur. Later a severe paralysis results, with nutritional defects, characterized by spontaneous fractures of the epiphysis from the shaft or long bones, and superficial ulcerations similar to the bed sores of

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myelitis. There are usually deformities of the joints. Morvan's disease, in which there is great deformity of the hands, is usually a result of syringo-myelia. The duration may cover a period of several years.

Locomotor Ataxia

Definition.—An incoordination in which there is a slow inflammatory degeneration of the posterior columns of the spinal cord, characterized by sensory and trophic disturbances.

Adjustment.—Atlas or axis, with K. P. The upper cervical subluxation interferes with the calorific and trophic impulses of the posterior columns of the spinal cord, the result of which is sclerosis.

Pathology.—The site of the degeneration may be located in any portion of the cord, and also the afferent spinal nerve roots, but is usually situated in the dorso-lumbar enlargement. The nerve fibres of the cord are first affected, they becoming swollen, inflamed and hyperemic. The axis cylinder is also swollen, and sometimes the surrounding membranes are inflamed and congested. This is especially true of the pia mater. The connective tissue proliferates and presses upon the nervous substance so that it atrophies and is replaced by the hypertrophied connective tissue. The posterior nerve roots and posterior nerve root ganglia especially suffer from this degenerative process. Many of the peripheral nerves undergo similar changes. The optic is affected more than any other single nerve. Sight is interfered with in over sixty per cent of cases, and complete atrophy occurs in six per cent of all cases.

There is no nerve tracing in locomotor ataxia.

Symptoms.—The symptoms are divided or classified into three stages—the initial, preataxic or stage of sensory disturbances, the second or ataxic stage, and the third or paralytic stage.

The initial or incipient stage begins with lightning-like pains of a moment's duration, and felt most commonly in the

legs and feet, but they may occur in the arms, trunk, or head. Herpes may occur along the course of these nerves or at the site of the pains. Paresthesia, such as burning, tingling, and formication, are common over the lower extremities, and in walking the patient feels as if he were walking upon a thick carpet, or that his shoes have thick cork soles. This is due to the loss of sensation, or numbness. If the cervical cord is affected similar symptoms will be noticeable in the arms, and the patient will have difficulty in buttoning his clothing. During this stage there is a great inclination on the part of the patient to sit with his feet raised to a level with the hips. Vertigo is common, and vision may be slightly affected during this stage.

The ataxic stage may last for several years, and begins when walking is so greatly interfered with that the ataxic gait is present. During this stage the lightning-like pains occur with less frequency, the knee jerk is lost, the girdle sensation is present, blurring of vision becomes common, numbness of the feet increases, the skin becomes dry and scaly, and the sexual function may be lost. In walking the feet are placed far apart, the patient stands in a stooped position, and the feet are raised unusually high, thrown far forward, and brought down hesitantly with the sole first. During this stage anesthesia becomes so marked that the patient is unable to locate his feet without the use of sight; diplopia is common, and rectal neuralgia occurs frequently.

The Argyll-Robertson pupil is a cardinal symptom in the analysis, and is one in which the eye accommodates itself to distance but not to light. This condition can be determined by placing two objects in line with each other, one object being placed about two feet from the patient, and the other twenty feet from the patient. After looking at the close object he should change and look at the far object, and it will be noticed there is a change in the accommodation; but if the degree of light is suddenly changed there is no change in the size of the pupil as in the normal.

Romberg's sign is present also, and is determined by blindfolding the patient while standing in the erect position. It will be seen that he sways to exceed one and one-half inches, and in most cases will fall. With the eyes closed, and the arm extended he is unable to place the tip of the finger upon the tip of his nose. With the eyes closed and both arms extended he is unable to bring the tips of the forefingers together.

Vision is poor in most all cases during this stage, and blindness, due to optic atrophy, occurs in six per cent of all cases. The neuralgic pain may also be present in the head and arms, but is less common than in the legs.

The inability to coordinate muscular action is due entirely to the loss of sensation in this stage, as the power of the muscles is as great as in health. However, emaciation may be quite marked, and deformities of the joints may occur. When the patient is lying flat upon the back with the thighs at right angles to the trunk the leg can be entirely straightened, which is rarely possible in the normal.

At times there may be marked gastric and intestinal symptoms, consisting of severe vomiting, rectal and gastric pains, and disturbed flow of urine; this is commonly spoken of as the gastric crisis.

The final stage is called the paralytic stage, and is characterized by paralysis, which is complete. The sexual function is abolished, and atrophy of all parts of the body occurs. With this paralysis there may be dementia or other cerebral symptoms, but, as a rule, they are not present.

The cardinal symptoms of locomotor ataxia are loss of the knee jerk, lightning-like pains, Romberg's sign, Argyll-Robertson pupil, loss of sensation, and the ataxic gait. The condition is usually readily recognized.

Locomotor ataxia is also called tabes dorsalis, and posterior spinal sclerosis.

Spastic Spinal Paralysis

Definition.—A sclerosis or hardening of the lateral white columns of the spinal cord, characterized by a spastic paraplegia.

Adjustment.—This is produced by an atlas or axis subluxation.

Pathology.—The pathology of spastic spinal paralysis is the same as that of lateral sclerosis, and when affecting adults is usually considered the same. The infantile form is also called Little's disease. The nerve substance in the lateral columns becomes atrophied, the neuroglia proliferates, presses upon and replaces the nerve substance. This condition may be localized or may extend over the entire length of the cord.

Symptoms.—At the onset the patient complains of a feeling of tiredness and stiffness in the legs with some aching pain in the back. The muscles become weak and stiff so that the spastic gait develops. In infants the onset may be with a convulsion, after which the child does not appear to be itself. As a rule it does not learn to walk, dentition is delayed, and the child may not learn to speak. The arms and legs are extended, and in the attempt to walk the legs cross and the child falls. In all cases the legs are stiff, the knees drawn close together, the legs are moved stiffly and with hesitation, and the toes drag and catch on the ground.

Under Chiropractic adjustments the pressure upon the cord or nerves affecting this condition is removed and coordination is restored.

The Combined Scleroses

Definition.—This term is applied to certain forms of inordinations in which various columns and tracts of the spinal cord undergo degenerative changes. Usually it affects the posterior and lateral columns.

Etiology.—This may be caused by any local subluxation, as would be determined by the symptoms and palpation, but is usually caused by a subluxation of the atlas or axis. K. P. should be included in the adjustment.

Pathology.—This disease usually affects the posterior and lateral columns, and begins with chronic inflammation, in which the vessels of the cord become hyperemic, the white substance becomes swollen, the neuroglia becomes thickened, pressing upon the nerve substance and replacing it. The sheath of the nerves becomes broken, the axis cylinder destroyed, and the part of the cord affected loses its normal function. This may begin in one tract and later appear in other parts, as can be determined by the symptoms.

Symptoms.—The onset will vary according to the part of the cord first involved. If the degeneration begins in the lateral columns, which it usually does, the onset will be with a feeling of weight, weakness and partial paralysis of the lower extremities. This weakness and feeling of discomfort increases, extending upward over both lower extremities and to the spinal muscles. The legs will be stiff, and the knee jerk will be exaggerated. If the degeneration lies in the cervical part of the cord the arms will be affected in a similar manner as the legs. The girdle sensation is present, and there may be slight emaciation. As soon as the posterior columns become affected the lower extremities become numb, there are scattered patches of anesthesia, the knee jerk may be lost, muscular spasticity will lessen, the vision is interfered with, diplopia being the principal disturbance. There is diarrhoea of the bowels, ankle clonus, ataxic gait, and a paraplegia involving both the motor and sensory functions. Occasionally the anterior horns of the gray matter will be affected and in those cases there is marked atrophy of the muscles. It usually requires several years for the affection to reach its height, after which it becomes stationary.

External Meningitis

Definition.—An inflammation or excessive heat affecting the external or outer layers of the meninges of the spinal cord.

Etiology.—This is caused by an atlas or axis subluxa-

tion, but C. P. and K. P. should be included in the adjustment if there is fever. Meningitis could be caused by a local subluxation anywhere in the spine, but is not so common as that produced by the atlas.

Nerve Tracing.—There is no definite nerve-tracing in meningitis, on account of the abnormal condition lying within the neural canal, but tenderness is extreme and diffuse along the spine.

Pathology.—The meninges become inflamed and swollen, their blood vessels are dilated and over-filled with blood, and there is an exudation into the neural canal and into the intermeningeal spaces, which produces pressure upon the cord and is responsible for many of the symptoms that arise. The dura mater is the layer affected in external meningitis.

Symptoms.—The onset is with severe spinal pain, which radiates along the course of the spinal nerves over the trunk and legs. Hyperesthesia is very marked along the spine, and is general in its distribution. Clonic spasms of various groups of muscles are present, and in the more severe cases there is partial paralysis, usually in the form of a paraplegia. The muscles affected are stiff, and become atrophied.

During the course of the meningitis, and especially early, there is fever of 100 to 102 degrees, with gastric and intestinal disturbances, scanty and highly-colored urine, coated tongue, and general weakness.

The atlas subluxation causes pressure upon the nerves having to do with transmission of the calorific function, producing its abnormal expression in the form of excessive heat. The atlas adjustment releases this pressure, permitting a normal flow of calorific impulses, whereby the heat of the meninges is restored to normal, and all symptoms disappear.

Acute Spinal Leptomeningitis

Definition.—An acute spinal inflammation or excessive heat of the thin membranes of the spinal cord, affecting the pia and the arachnoid membranes.

Etiology.—As in the external form, this is caused by an atlas or axis subluxation interfering with the flow of calorific impulses and producing excessive heat. C. P. and K. P. should likewise be included in the adjustment.

Pathology.—In this form of meningitis the inflammation is limited to the thin layers of the membranes of the cord, usually affecting the pia matter. It becomes swollen and red from the hyperemic blood vessels. Exudation occurs from the membrane into the intermeningeal spaces and presses upon the cord substance. If the pressure at the atlas is sufficient it may produce myelitis in combination with the meningitis. The condition is then known as **meningo-myelitis**.

Symptoms.—Since the pia matter is nearer to the cord than the dura, there is a greater degree of paraylsis and less pain in leptomeningitis than in external meningitis. This begins with radiating pain in the back and extremities, tenderness along the nerve trunks, stiffness of the spinal and other muscles, and an initial chill which is followed by a slight fever of about 102 degrees. There is a marked rigidity of the spinal muscles, which produces cervical retraction, and sometimes amounts to opisthotonous. The muscles finally become atrophied but may remain spastic, the sensory function may be dulled, and the patient is left in a state of paralysis which pursues a chronic course.

Serous Meningitis of the Brain

Definition.—As its name implies, is an inflammation of the membranes surrounding the brain, accompanied by an effusion of serum. Also known as **exudative meningitis**.

Adjustment.—Atlas or axis, C. P., and K. P.

Pathology.—The atlas or axis subluxation causes the inflammation or excessive heat in the meninges of the brain. Excessive heat is characterized by swelling of the membranes, hyperemia of the blood vessels and exudation of serum. In cerebral meningitis this effusion is large and presses upon the

brain, producing many cerebral symptoms. The condition may be localized or affect the entire meninges of the brain.

Symptoms.—This begins with a severe headache, spinal pain, chill, and a fever varying from 102 to 105 degrees. With the rise in the temperature the cerebral symptoms are manifest, and consist principally of a low muttering delirium. At times the delirium will be replaced by stupor. There is cutaneous hyperesthesia over the entire body, the legs, arms, and neck are stiff. There is cervical retraction, opisthotonus, ptosis of the eyelids, a brown-coated tongue, dilatation of the pupils, and in children convulsions. Vomiting is often severe and persistent, even though the stomach is empty. Paralysis ensues, involving all the muscles of the body, with a severe degree of prostration.

The adjustment of the atlas relieves the pressure upon the nerves leading to the meninges of the brain, thus restoring the calorific function to normal, whereupon the hyperemia and swelling subside, and coordination rapidly supervenes.

Apoplexy

Definition.—An effusion of blood occurring suddenly into the substance of an organ. Intracranial apoplexy is a hemorrhage occurring within the skull. Cerebral apoplexy is hemorrhage into the substance of the cerebrum. Cerebellar apoplexy is hemorrhage into the substance of the cerebellum. Pial apoplexy is hemorrhage into the substance of the pia mater. Pons apoplexy is a hemorrhage into the substance of the pons.

Etiology.—The cause of intracranial apoplexy is an atlas or axis subluxation which impinges the nerves conveying the motor function to the muscular fibers of the blood vessels of the brain or cranial viscera, causing these muscle fibers to relax, and permitting the blood to ooze out between the fibers into the surrounding tissue. Most frequently occurs in vessels whose elasticity is slight, and in individuals who have a high blood pressure. K. P. will lower the blood pressure.

Pathology.—The blood vessel walls may be hard, and the muscular fibers be inelastic. The blood pressure is usually high. The local subluxation reduces the amount of motor function expressed in the muscular fibers so that they are relaxed and inelastic. The minute muscular fibers become pro-lapsed, and separate so as to permit the escape of blood. The brain substance being soft, is easily displaced and pressed upon by the clot, which renders the part functionless, and produces a motor paralysis of all parts of the body supplied by nerves arising from the affected portion of the brain. Hemorrhage of the brain most frequently occurs from the middle cerebral artery or its branches. Meningeal apoplexy most frequently occurs at the base of the brain from the basilar artery.

Symptoms.—This is more commonly known as a “paralytic stroke.” When occurring gradually there are prodromal symptoms, consisting of headache, vertigo, pains in the head, and numbness or tingling in the extremities. Following this there may be vomiting and hemiplegia. Most cases, however, occur suddenly, when the blood is suddenly effused into the substance of the brain. It may begin with a sudden pain in the head, and the patient will fall into a state of apoplectic coma. In a few cases the coma may be attended with convulsions, but usually they are absent. The respirations are slow, noisy, and irregular, Cheyne-Stokes type being frequently present. The pulse is full and slow, and the cheeks puff out with expiration. The pupils are unequally dilated, and one side of the body is paralyzed. The hemiplegia is of the side opposite to the side of the hemorrhage, except of the face, which may be paralyzed on the side of the hemorrhage. There may be conjugate deviation of the eyes and head toward the side of the hemorrhage. The paralysis of the face may be determined by smoothing out the wrinkles of the face, and it will be noticed that one side returns to its normal shape more rapidly than the other, and by raising the leg or arm and permitting them to drop it will be seen that the paralyzed

extremity drops as if dead. There is usually a slight fever of 100 to 101 degrees, the paralyzed side being one or two degrees warmer than the unaffected side. In fatal cases the temperature may suddenly rise to 106 degrees, and death soon follows.

The majority of cases are not fatal; in those that recover the coma disappears in from five hours to five or six days, after which there is great weakness, mental confusion, disturbances of speech, and hemiplegia. The severity of this paralysis depends upon the extent of the hemorrhage into the brain. Both motor and sensory function may be affected during the early stages, but the sensory function is soon restored. The face on the side of the hemorrhage, and the arm and leg on the opposite side, are involved in the hemiplegia. The paralysis may entirely disappear from the face within the first two weeks, and will be gradually diminished in the leg during the first six months. The arm improves the least of any part. Finally the paralysis becomes stationary, and the muscles become rigid and stiff. The shoulder on the affected side droops, and in walking the patient has the characteristic mowing gait, the foot being swung around in walking. There is but very slight atrophy of the muscles, and there may be tremor, and occasional aching pains in the paralyzed extremities.

The adjustment of the atlas restores normal tonicity in the muscular fibres of the cerebral vessels so that their walls are strengthened and hemorrhage is stopped. The blood that is already effused into the cerebrum is gradually absorbed, whereupon the paralysis subsides. Cases of apoplectic hemiplegia have completely recovered after receiving thirty adjustments. Results are more favorable if the case is obtained before the muscles become spastic.

Acute Softening of the Brain

Definition.—An incoordination in which there is a degenerative change or softening of the cerebral tissue, accompanied by embolism or thrombosis of the cerebral vessels.

Adjustment.—Atlas and K. P.

Pathology.—The thrombosis and embolism usually affects the terminal branches of the middle cerebral artery. If the affected branch has anastomoses the collateral circulation compensates for the obstruction, and no anatomical change develops, but if an end artery or vein is obstructed, the blood beyond the point of anastomoses becomes stagnant and the serum oozes through the vessel walls into the cerebral tissue. The added quantity of serum makes the brain tissue abnormally soft, and if serum only oozes through the vessel walls, the result is yellowish-white softening. When the relaxation of the walls is sufficient to permit the escape of red blood cells it is called red softening. In such cases the red cells undergo disintegration, losing their hæmoglobin, and turn into yellow or white softening.

Thrombosis affects the veins more frequently than the arteries, and when such is the case the onset is slow, and the thrombus is the result of a thickening of the tunica intima. Embolism always affects the arteries and occurs suddenly, as it is carried by the blood stream, and when stopped because of a decrease in the size of the vessel, gives rise to sudden symptoms.

Symptoms.—Embolism is common in apoplexy, or rather apoplexy usually follows embolism, and the symptoms of the two are about the same. Thrombosis, which is common and gradual, begins with headache, vertigo and loss of the memory. The mentality of the patient is affected, as is indicated by the change in his character, despondency, and absentmindedness. The vision is impaired, and speech is slow and hesitating. Walking is greatly hindered, and soon paralysis develops. The paralysis is often in the form of a hemiplegia, and, as a rule, develops gradually. It may involve motor or both sensory and motor functions. The paralysis is followed by dementia, which progresses slowly, as does the paralysis, often requiring many months or years to reach its height.

Hemorrhagic Encephalitis

Definition.—An acute inflammation or excessive heat in the brain tissue, which is accompanied by hemorrhage.

Adjustment.—The atlas should be adjusted to restore the normal transmission and expression of calorific impulses in the brain and to restore the normal expression of motor impulses in the muscular fibres of the blood vessels. When this is accomplished both the inflammation and the hemorrhage will stop.

C. P. and K. P. for fever.

Pathology.—As a result of the inflammation the cerebral vessels are congested and the vascular exudation into the brain substance produces swelling and softening. The vessel walls are relaxed because of lack of motor power, their muscular fibers separate, and the blood oozes into the adjacent tissue. This most commonly occurs in connection with suppurative encephalitis or abscess of the brain.

Symptoms.—The onset is sudden, with severe headache, spinal pain, cervical retraction, photophobia, vertigo, and high fever. The skin is hot and dry, the pulse is bounding and rapid, the respirations are shallow and accelerated, the tongue is heavily coated, gastric and intestinal disturbances are present, and the patient is delirious. The fever becomes irregular, with extreme prostration and finally stupor, coma and paralysis supervene. The paralysis affects deglutition, speech, and the skeletal muscles in general, or sometimes only as a hemiplegia.

Abscess of the Brain

Definition.—An incoordination in which there is a circumscribed accumulation of pus in the brain, surrounded by a pyogenic membrane.

Adjustment.—Atlas, C. P. and K. P.

Pathology.—There may be one or more abscesses of varying size located in various portions of the brain. This begins

with inflammation or excessive heat, which becomes suppurative in character, forming pus, which accumulates in the brain. In order to prolong life and prevent the destructive effect of the suppurative inflammation, Innate builds a wall of connective tissue around the pus area, called a pyogenic membrane. Upon this pyogenic membrane will be found many white cells, principally phagocytes. The brain cells within this pus-forming area will be destroyed and transformed into pus.

There is marked tenderness upon the scalp over the region, which may be traced to atlas or axis upon nerve tracing.

Symptoms.—This begins rather suddenly in most cases, with intense headache of a throbbing character, mental dullness, vertigo and irregular fever. Vomiting, which is of the most persistent character, results from the pressure upon the vomiting center of the brain, and motor and sensory disturbances may result from the same cause. The toxic symptoms are characterized by the irregular fever, delirium, stupor and coma, and by the general signs of serous poisoning. As a result of the destruction of certain portions of the brain there is paralysis, aphasia, and, possibly, convulsions; the motor paralysis varying according to the location of the abscess in the brain and the centers in the brain involved by the destruction. C. P. and K. P. are adjusted to reduce the fever and eliminate poison from the body, and the atlas adjustment restores normal function to the local inflammation of the brain.

Hydrocephalus

Definition.—Hydrocephalus is an accumulation of water or serum within the cranium, and is also known as dropsy of the brain, water on the brain, or ventricular distention.

Adjustment.—Atlas or axis with K. P.

Pathology.—The serum or cerebrospinal fluid may accumulate between the layers of the meninges, or between the meninges and the brain, but in most cases the bulk of the

accumulated fluid is in the ventricles, and may vary from an ounce to a pint. Some authorities believe there is an obstruction existing in the upper portion of the central canal of the spinal cord, which prevents the communication between the ventricles and the canal, thus producing the excess accumulation in the ventricles of the brain. The head becomes large, the fontanels fail to ossify, and the membranes covering them are distended by the endocranial pressure.

Symptoms.—This disease occurs more frequently in males, and usually appears during the first year in life, which may be accounted for from the fact that the male infant is larger than the female, thus causing a more difficult childbirth, at which time the atlas subluxation is caused, hence the early appearance of the symptoms.

The child becomes irritable and his head enlarges. The posterior fontanel, which should normally close during the second month of life, fails to close, and the anterior fontanel, which should normally close during the twenty-second month, also fails to close, and the membranes covering them bulge. The head is large and globular, and the normal symmetry of the head and face is lost. If the condition has developed early in life the child may not learn to walk. The general nutrition is impaired, vomiting may be severe and persistent from the pressure upon the brain, and defects in vision, either diplopia or blindness, may occur. In the late stages there are convulsions, with increased severity of previous symptoms.

Infantile Cerebral Palsy

Definition.—A form of paralysis developing shortly after birth, in which there is abnormal development of various areas of the brain.

Adjustment.—The specific adjustment for cerebral palsy is atlas or axis.

Symptoms.—The atlas or axis subluxation produces pressure upon the nerves connecting the Innate and educated por-

tions of the brain, and upon the motor nerves leading to the muscles of the body. Although this pressure may have been produced at birth the symptoms may not appear for several weeks. However, they usually appear with a convulsion or multiple convulsions, which may have been preceded by a period of restlessness and irritability of the child. The convulsions may be general or localized to one side of the child, and is accompanied with fever for a few days. Before the fever subsides it will be found that the child is paralyzed, usually on one side, affecting the arm, leg and face. The growth of the paralyzed side is retarded, the muscles become rigid and are cold. From the contractures of the leg muscles club foot may develop. The deformity may be talipes equinus, varus, valgus or calcaneus, or combinations of these. The deformity of the hand may result in the claw-hand, in which the thumb is flexed into the palm of the hand, the hand is extended and the distal phalanges are flexed. There is a lack of mental development, and the head is frequently abnormally shaped, either large, small or irregular. The teeth appear late and are usually deformed, speech may be indistinct, the voice is childish, the thoughts are immature, the mind is feeble, and the result is imbecility or idiocy, with hemiplegia or diplegia. When obtained early they usually recover under the proper Chiropractic adjustments, but when advanced and old the deformity is permanent.

Tumor of the Brain

Definition.—An abnormal overdevelopment of a part of the cerebrum, or a hyperplasia of the connective tissue within the cranium.

Adjustment.—Atlas or axis, with K. P.

Pathology.—This may be a simple tumor in which there is an overabundance in the production of cells in a part of the brain, the result being a cerebral tumor, or it may be a similar condition affecting the meninges or blood vessels of

the brain. The tubercle of tuberculosis and the gumma of syphilis are also common tumors of the brain. The tubercle has the same pathological consistency as previously described under tuberculosis, and the gumma the same as previously described under syphilis. (See Tuberculosis and Syphilis.) The tumor presses upon the brain and thus produces the symptoms.

Symptoms.—The symptoms will vary according to the size and location of the tumor and the disease with which it may be associated. The first noticeable symptom is headache, localized at the point of the tumor, and is continuous in its duration. Vertigo and disturbances of the special senses are always constant symptoms, and are due to pressure upon these centers in the brain. The pupils are unevenly dilated and the reaction to light is lost in the eye on the affected side. There is often diplopia or double vision, and convulsions, either localized or general, followed by paralysis. The patient becomes bedfast and has a marked tendency toward sleeping, is listless and eats but little. Vomiting without nausea, indicating cerebral pressure, is persistent. Of the mental symptoms the loss of memory is the first to appear, and is followed by irritability, loss of power of concentration, slowness of thought, and general mental and physical exhaustion, from which he dies.

Multiple Sclerosis

Definition.—This is also known as cerebrospinal sclerosis, and is a chronic incoordination of the brain and spinal cord, in which are various localized areas of degenerated nerve tissue, partly or completely replaced by connective tissue.

Adjustment.—Atlas or axis.

Pathology.—The pathology of multiple sclerosis is the same as that of the spinal sclerosis previously described, except that in this disease there are multiple areas of degener-

ation, varying in size, and located in the white substance of the brain, and in both white and gray substance of the cord. The areas or patches consist of a hyperplasia of connective tissue, of nerves which press upon and produce atrophy of the nerve elements. This structural change in the brain and cord interferes with the function of the part thus affected, giving rise to motor, sensory and mental symptoms.

Symptoms.—The onset is very slow and gradual, the patient being unable to recall when the condition started. The first symptom to attract the attention of the patient is pains in the legs and back. At the same time, or soon after, it will be noticed that the individual is slow to think and has a poor memory for recent events. The muscles of the hands become unsteady when writing, and the gait is of the pseudo-ataxic type when the patient attempts to hurry. The speech is slow and scanning. During conversation the patient will suddenly and unknowingly change the subject under discussion, and is unable to talk upon any subject intelligently for any length of time. The tongue may seem large for the mouth and seemingly protrudes, the knee jerk is increased, the muscles are stiff and spastic and so weak that the patient falls frequently. There is a tremor that is noticeable early, and is increased upon excitement. It extends to the head, producing a sort of nodding spasm. The sexual function is lost, vision is poor, and there may be nystagmus, optic atrophy, or disturbances in hearing. The mental impairment is in proportion to the extent of the abnormality in the brain, and in many cases amounts to meloncholia or other forms of insanity.

SECTION 14

THE CONSTITUTIONAL DISEASES

Chronic Rheumatism

Rheumatism is an acute or chronic incoordination of nerves, muscles, articulations, membranes or bones, characterized subjectively by pain and objectively by local fever, redness, swelling, stiffness and sometimes deformity.

Adjustment.—The adjustment for all forms of rheumatism is K. P. in combination with local. For example, if the arm is affected the adjustment is A. P. and K. P., or the leg affected the adjustment is K. P. and lower lumbar.

Pathology.—There is an inflammation or excessive heat in the nerve substance, the nerve sheath, or the tissues at the periphery of the impinged nerve. This is most frequently located in the joints, and is consequently called articular rheumatism. The affected joint becomes swollen and edematous. The synovial membrane becomes thickened and its secretions diminished. As a result of this thickening and diminished secretion the joint becomes stiff, the excessive heat bringing about stiffening of the cartilage and bone from which the deformity occurs. The joint may become ankylosed from the formation of false exostoses and remain permanently stiff.

Nerve Tracing.—There is always local tenderness emitting from the local subluxation and following the course of the impinged nerve to the part or parts affected.

Symptoms.—The cardinal symptom is pain, which is subject to marked exacerbations. It is more or less dull and aching continuously, but is severe and sharp at times. Usually several joints are affected, and are marked by swelling, redness and tenderness. In order to minimize the pain, which

is increased upon friction, the muscles become tonically contracted. There is some atrophy for nonuse, the urine is highly acid and the skin has an acid odor.

Muscular Rheumatism

Definition.—A form of rheumatism, in which the site of pain, is located in the nerve endings of muscles, or their point of attachment. Also called **myalgia**.

Adjustment.—K. P. in combination with local.

Symptoms.—The onset is sudden, with pain of increasing intensity, upon muscular action. One or many muscles may be affected. When localized in the lumbar muscles it is called lumbago, when in the intercostal muscles, is called pleurodynia, and in the hip, thigh or elsewhere is called myalgia. If the attack is acute, there is fever of a moderate degree. The pain is intense, the patient being unable to move the affected muscles, or, perhaps, unable to roll over in bed. There is muscular contraction, which may be spasmodic or continuous. The urine is scanty and highly acid, the sweat has an acid odor, and the individual is usually constipated. When the intercostal muscles are affected respiration is greatly hindered. The acute attack lasts from one to two weeks and may finally become chronic. In the chronic form the pain is less intense and may be intermittent.

Diabetes Insipidus

Definition.—An incoordination of the kidney, characterized by the passage of large quantities of pale urine and excessive thirst.

Adjustment.—The specific adjustment in this incoordination is K. P. There is no pathological condition in the kidney, but because of abnormal expression of function the organ becomes unable to discriminate in the amount of elimination of fluid. The excess elimination of urine or fluid drains the serum and suppresses the secretion from the various glands.

The excessive thirst is therefore adaptative to increase the fluidity of the blood and serous circulation.

Symptoms.—The cardinal symptom is polyuria, large quantities of pale, slightly acid urine being voided. The amount varies greatly in different patients. It is not uncommon to pass two or three gallons in twenty-four hours. The urine is of low specific gravity, varying from 1.001 to 1.008, while normal specific gravity is 1.020. There may be aching pain in the lumbar region over the kidneys. The skin is dry and scaly, the mouth is dry, and there is great thirst and hunger. The bowels are constipated, the temper is irritable, memory is poor, the eyes are weak, and headache at the vertex of the skull is usually present. Chemical analysis shows the urine to be free from sugar, albumin, casts and other acids or substances found when pathological conditions exist.

Under the adjustments recovery is rapid, the amount decreasing from two or three gallons to the normal three pints, or thereabout.

It can be distinguished from diabetes mellitus by the absence of sugar and a low specific gravity; from chronic interstitial nephritis in the greater amount of urination, the absence of casts, albumin in small quantity, color of the skin and the characteristic urinary smell. Chiropractically, the prognosis in diabetes insipidus is always good.

Diabetes Mellitus

Definition.—A constitutional or metabolic incoordination characterized by great augmentation in the quantity of urine and manifest alteration in its secretion, with thirst, hunger and emaciation.

Adjustment.—K. P. in combination with local subluxations, which might affect the organs of digestion, especially the pancreas and liver. In this incoordination the sugars cannot be assimilated, therefore when eaten are thrown off, so as not to be a burden to the circulatory organs. The glycosuria, therefore, is adaptative.

Symptoms.—Most cases begin insidiously and run a chronic course, but often, when affecting children, the onset is sudden and the duration is short. In these cases of brief duration the patient becomes weak, emaciated, has great thirst and hunger, and polyuria. The symptoms increase in severity, death occurring from exhaustion in two weeks to a few months.

Most cases, however, when affecting adults, begin slowly, with an increased flow of urine, the patient noticing that it is necessary to arise one or more times during the night to urinate. At the same time it will be noticed that the thirst is greater and more water is being drunk. The amount of urine voided in twenty-four hours will vary greatly in different cases, from four to thirty pints. It is a pale, clear color and has a sweetish taste and odor. The specific gravity is high, varying from 1.025 to 1.045. Chemical analysis shows the presence of sugar in quantities from one-tenth to ten per cent. The urine also contains acetone and diacetic acid. There is an odor of overripe fruit in the room occupied by a diabetic patient. The skin is dry and scaly and is intensely itchy. Thirst is persistent and the mouth is dry and parched. The breath has a sweetish odor, the tongue is red and fissured, the appetite is excessive and the bowels are costive from the draining of serum by excessive urination.

Flesh and strength are lost gradually and in proportion to the progress of the disease, sleep is poor, the eyes become weak, the temper is irritable, the sexual function is weakened and finally lost, the heart's action is weak, the pulse is irregular and of low tension, the power to concentrate is lost, headache at the crown of the head is common, and finally the kidneys become weak from overwork and are unable to eliminate the metabolistic poisons, so they are retained within the body and break out as an eczema, with intense itching. The enumerated symptoms steadily increase in severity, with weakness and emaciation, until death results. Finally the kidneys fail to excrete, and dropsy results. During the late stages

diabetic coma may occur, in which there is deep and profound sleep, but is only recognized by the accompanying symptoms of diabetes, and especially the urinary symptoms.

Although diabetes is considered an incurable disease from a medical standpoint, fully 90 per cent completely recover under Chiropractic adjustments. The time required to bring about complete restoration is very variable, depending upon the recuperative powers of the patient, his vitality, the degree of the subluxation, etc. Cases of twenty and twenty-five years' standing have completely recovered after one month's adjustments.

Gout

Definition.—A general constitutional incoordination, one characteristic factor being the deposition of sodium urate in and about the joints, and is accompanied by inflammation.

Adjustment.—Since this usually affects the meta-trasophalangeal joint of the great toe, the local adjustment is at fourth lumbar, but K. P. should also be adjusted so as to increase the normality of the kidneys, that they may be enabled to excrete the excess of urates, thus preventing their deposition in the articulations.

Pathology.—There is a localized inflammation of the small joints, and especially the great toe, with redness from the hyperemia and swelling from the edema. The prolonged excessive heat causes crystallization of the calcareous material, which becomes deposited in the inflamed tissues. This deposit of sodium urate deforms the joint, and in appearance it simulates an exostosis. Finally the skin may ulcerate and the chalky deposit will perforate through. Deposits are also found on the tendons, cartilage and skin.

Symptoms.—The acute form begins suddenly during the night, with an intense pain in the great toe, a chill, fever of 102 degrees or less, and extreme restlessness and insomnia. The toe is greatly swollen, very red, tender, and the surrounding skin is glossy, tense and shiny. The pain diminishes upon

constant motion, and may entirely disappear after two or three hours, to return the following night. The attacks may occur with regularity each night for five or ten days, after which there may be a long interval of rest. Individuals who have experienced previous attacks usually have prodromal symptoms, indicating the oncoming of an attack. These consist of drowsiness, constipation, palpitation of the heart, irritability of temper, scanty, high-colored urine, and aching pains in the lower extremities.

Chronic gout results from the many recurrences of acute attacks. The inflammation becomes chronic and causes a crystallization of sodium urate which is deposited in and around the joint, producing disability and deformity. Many joints may finally become involved, spreading from the great toe to the rest of the phalanges of the foot, the ankle, knee, and upper extremities. The deposits of this tophi deforms and produces ankylosis of the joints involved. Later in the incoordination there are deposits of the tophi in the cartilage of the ear, sternum, ribs, larynx, in the tendons of the muscles, and in the skin. Portions of the deposit may be exposed because of ulceration of the skin covering them. The blood vessels become hard and inelastic, making the blood pressure high, thus increasing the peripheral resistance and inducing hypertrophy of the left ventricle. In addition to the above named symptoms there may be gastric and intestinal symptoms of a severe type; vascular symptoms pertaining to the heart and blood vessels, and renal symptoms, indicating disturbances in the function of the kidneys. Gout can be distinguished from articular rheumatism in that the latter affects the larger joints, is not attended by the severe pain of gout, does not have the excessive hyperemia and venous congestion of gout, and usually has a fever that is more severe than that of gout. In rheumatism the attack is not so intermittent, and there is no deposit of tophi in the cartilage, tendons and skin.

Arthritis deformans affects the small joints as does gout,

but the attack is gradual and the pain is present continuously, not being intermittent during the day, as is the case in the onset of gout. The deformity in arthritis deformans consists in a softening of the bone and formation of false exostosis, and not in the deposit of sodium urate.

Arthritis Deformans, *Articular Rheumatism, inflammatory Rheum.*

Definition.—A chronic incoordination of the joints, characterized by changes in the cartilage, and synovial membranes, with periarticular formation, of bone and great deformity.

Etiology.—This is caused by local subluxations, impinging the nerves having to do with the expression, of the calorific function, thereby causing abnormal, expression of this function, as is expressed in the production of an inflammatory deformity. In cases where the arthritis is limited to the vertebræ the cause is a subluxation of the atlas or axis. K. P. should be included in the adjustment in all such cases.

Pathology.—During the early stages the synovial membrane is hyperemic and swollen, the synovial secretion is increased, making the entire joint appear edematous, and the motion of the joint is diminished, because of the pain produced upon motion. The continued inflammation, or excessive heat, produces a proliferation, of the connective tissue corpuscles, with resulting thickening, of the membrane and suppressed secretion, of the fluid from sclerosis of the secreting cells. This hypertrophy of the synovial membrane, tends to stiffen the articulation. The periarticular cartilage is disintegrated and disappears, so that the ends of the bones are exposed and raw. The ligaments and surrounding structures become greatly thickened, and bony nodules form from the raw ends of the bones, effecting ankylosis of the joints. The nodules give to the extremity affected a peculiar and characteristic deformity.

Nerve Tracing.—Tenderness is traceable from the local subluxation along the course of the impinged nerve to the parts affected, often becoming diffuse around the affected joint.

Symptoms.—There is an acute and a chronic form. The acute form begins with pain in the small joints, simulating acute rheumatism. The pain is intense and constant, but the swelling and hyperemia are slight. Many joints are affected at the same time, possibly involving both upper and lower extremities. This always affects the small joints, but with time may also involve the larger ones.

The chronic form is more common and is always symmetrical, involving both lower extremities or both upper extremities, or possibly all four extremities. The peripheral joints become swollen and slightly red, and this condition is attended with a moderate degree of pain which is subject to exacerbations at times. Small, bony growths form upon the ends of the bones as a result of epiphyseal proliferation, and finally effect ankylosis of the joint involved. The adjacent muscles are tensed and undergo slight atrophy. The hands are deformed and many of the fingers may be partially flexed. The skin is smooth and glossy, and the wrist is broad and flat. It is not uncommon to find small petechial spots, or arthritic purpura, beneath the skin. Finally larger joints may become involved, with similar deformities and stiffness.

The monarticular form is so named because it affects only one joint, and is more commonly found in elderly people. The pathological changes are the same as those described. The joint is finally ankylosed and made permanently stiff. The hip, shoulder, and knee joints are most frequently involved.

Heberden's Nodosities is a peculiar nodular deformity affecting the distal phalanges, in which there is a bony growth formed upon the dorsal aspect of the joint, preventing it from being extended. This bony nodule can be palpated, is usually red, swollen, and slightly tender.

Rickets

Definition.—Rickets, which is also known as rachitis, is an incoordination beginning in early life, characterized by

impaired nutrition of the entire body, abnormality of the long bones and various incoordinate muscular movements. Also called Barlow's disease.

Adjustments.—Atlas or axis, S. P., and K. P.

Pathology.—The first noticeable changes occur in the bones. The long bones have an overabundance of organic matter and a deficiency of inorganic matter; this makes them soft, and when weight is placed upon the legs causes a bending of the bones in the leg and thigh. The ends of the bones become soft and spongy, and nodules form upon them from the epiphyseal proliferation. A series of bony nodules form upon the sternal end of the ribs and on the costal cartilages, which is commonly known as the rachitic rosary. Spontaneous fractures are common, especially at the junction of the epiphysis and shaft of the femur and the upper end of the tibia. The bones of the skull may become abnormally thin in places, from absorption of the mineral matter, leaving spots that can be indented upon slight pressure. This is known as *craniotabes*.

Symptoms.—This most frequently occurs in males, and appears early, and may be accounted for by the fact that the male head is much larger than the head of the female. Therefore may be the cause of a more difficult childbirth, which would increase the possibility of producing an atlas subluxation at that time sufficient to cause the incoordination.

The symptoms manifest themselves during the first year of life, and begin with restlessness, irritability and slight fever. The child cries a great deal, wakes frequently during the night, and has drenching sweats, especially around the head. There is a general hyperesthesia over the entire body, which would further indicate a cord pressure at the atlas. The child fails to eat as formerly, therefore becomes thin and emaciated; the skin is pale, the fontanels fail to ossify and are depressed, and the sutures of the cranial bones are deep and furrowed. Detention is delayed, and the teeth that do appear are small and irregular in shape. The child becomes

anemic, and though he may eat well, the food is not assimilated. The abdomen protrudes, making the child pot-bellied, the face is thin and narrow, and the head appears to be greatly enlarged, but this is due to the abnormal shape, caput quadratum, resulting from the formation of bony plates, being found upon the frontal and parietal eminences. The hair on the back of the head is worn off by the constant turning of the head from side to side, and the back of the skull becomes the site of craniotabes. The ribs become very near the horizontal because of the bulging anteriorly of the chest, while the lower costal cartilages appear to be pressed backward. The legs and arms become deformed because of the softening. Talipes may occur in the feet, while the muscles are thin and long, of a doughy character, and the skin is moist and clammy. The nutrition of the entire body suffers, and every bone may be deformed because of this fact.

The child grows, but not at the normal rate of speed, and his body is not well proportioned. The muscles are usually stiff, and the hands and arms may be in constant involuntary motion. Walking is very difficult, and in many cases it is impossible for the patient to retain his equilibrium.

Obesity

Definition.—An incoordination of the metabolism in which there is an excessive accumulation of fat evenly distributed over the entire body.

Adjustment.—The principal adjustment is at K. P. Local adjustments may be made which would affect the digestive tract, Li. P. and L. S. P.

Symptoms.—Obesity has been called "oil dropsy" or general fatty infiltration. As a rule fat is no sign of health, and especially so in children, yet some people who are very stout enjoy the best of health. Obesity is not always associated with overeating, for many corpulent people are very small eaters, and it is not uncommon to find very hearty eaters

who are thin. It is not how much we eat or what we eat, but how what we eat is assimilated that makes us corpulent. This is controlled by the manner in which the primary functions are permitted to be expressed in the tissues of the body, and so long as there is no hindrance to the transmission of impulses from the brain to all tissues this function is carried on normally, but should there be vertebral subluxations interfering with the flow of vital force, the metabolism will become abnormal, and the result may be obesity.

Many cases experience no great discomfort, while others have difficult breathing, irritability of the heart, pendulous abdomen, and in order to maintain the equilibrium assume a posture that produces an adaptative lordosis of the lumbar region. Other cases develop during early life or about the age of puberty. The child is large for his age, the muscles become soft and flabby, the bowels sluggish, the skin cool and moist, the heart enlarged and displaced, the pulse strong and slow, the respirations rapid upon very slight exertion, and there is a great indisposition to exercise. There is abdominal discomfort and thoracic oppression, and in sleeping the patient may require a position in which the head is greatly elevated in order to make respiration more comfortable. As a rule life is not shortened unless the heart is involved, and if the heart is crowded, made to work harder under difficulties by the abnormal deposition of fat, it will hypertrophy and later dilate, when compensation is lost. This may be fatal.

Adiposis Dolorosa

Definition.—A metabolic disturbance characterized by irregular deposits of fat in various parts of the body, preceded by or attended with severe burning pain.

Adjustment.—Atlas, K. P., and possibly local for the digestive tract, as will be determined by spinal analysis.

Symptoms.—This is a very rare incoordination, and most frequently occurs in fat individuals. The patient gradually

increases in size, and fatty tumors form over the entire body. These tumors are located deeply in the abdominal and thoracic cavities, and superficially in the subcutaneous areolar tissue. They may vary in size from that of a pea to large tumors four or five inches in diameter. The fatty tumors do not appear upon the palms of the hands nor upon the soles of the feet, and but very rarely form upon the face. Each tumor is attended with a severe burning pain which is so severe that it keeps the patient awake, and serves as a differential symptom from multiple lipoma. Tenderness is also present to a marked degree, and is absent in lipoma.

SECTION 15

THE INTOXICATIONS

Alcoholism

Definition.—An incoordination resulting from the introduction of alcohol into the human economy, characterized by muscular incoordination, mental disturbance, and finally narcosis.

Adjustment.—When an individual is in a state of narcosis or under the influence of alcohol to any extent, the adjustment should be for the purpose of increasing the rapidity of the elimination of the narcotic from the body. This would be affected by adjusting K. P., but the adjustment for alcoholism would include more than this, for there is an abnormal desire for that which is not food; that is, the appetite is perverted, and this would be rectified by an S. P. adjustment. In addition to this, it is known by many that alcohol is detrimental to the body and tends to shorten life, yet because of a weak will they are unable to resist taking the poison when the perverted appetite craves for it. This weakness of the will power is caused by an atlas subluxation, hence the complete adjustment in cases of alcoholism is atlas, S. P. and K. P.

Symptoms.—Acute alcoholism is the result of the sudden introduction of a large quantity of alcohol into the human body, which is capable of producing a state of narcosis. The onset of the narcosis is gradual after the drinking of the liquor, and is characterized by mental disturbances such as incoherent speech, hyperactivity of the mind, the performance of rash acts, impaired judgment, sleepiness, and finally the patient passes into a stupor, or alcoholic coma. The coma is

characterized by a flushed face, which may be slightly cyanosed, a steady, slow, and heavy pulse, slow, deep respirations and dilated pupils. The surface temperature is slightly below normal, and the odor of the alcohol is marked upon the breath. By firm pressure upon the supraorbital notch, pinching the nose or dashing cold water on the face, the patient may be aroused, and always resents being awakened by blows or incoherent speech. It is necessary to distinguish this state of unconsciousness from apoplectic coma. Apoplectic coma occurs more suddenly, the pupils are unevenly dilated, there may be conjugate deviation of the eyes, the head may be turned to one side, and there are evidences of a hemiplegia which can be determined by examination of the muscles of the extremities and face.

Chronic alcoholism is the result of the long-continued use of liquor. There is a marked unsteadiness of the muscles, especially those of the hand, as can be noticed in writing. There is slowness of thought, the memory is poor, the judgment is impaired, the temper is irritable, and there is a peculiar and offensive odor to the breath. The eyes and nose are red from sclerosis and dilatation of the cutaneous capillaries, there is an abnormal thirst, the bowels are constipated, and the digestion is poor, because of the destructive effect of the alcohol upon the delicate mucous membrane lining the digestive organs.

The poisonous effects of alcohol are manifested in three ways: (1) Its narcotic effect or its action as a functional poison. This is best seen in the acute form, when the nervous mechanism is unable to coordinate because of the effect of the poison. (2) As a tissue poison, such as is seen in epithelial and nervous tissue, where it produces a slow degeneration or hardening. (3) As a checker of tissue oxidation; that is, the alcohol is oxidized or consumed, in place of the fats and food properties. Many of the cases of acute alcoholism are the result of dipsomania, or a periodical craving for the beverage.

Delirium Tremens

Definition.—A state of mental agitation, characterized by restlessness, incoherence of speech, delusions and sensory perversions, resulting from the long-continued and overuse of alcohol.

Adjustment.—Atlas and K. P. The K. P. adjustment is for the purpose of increasing the rapidity of the elimination of the alcohol from the body, and the atlas adjustment is for the purpose of increasing the flow of mental impulses to the lobes of the brain in which are located the functions of consciousness, giving to these lobes added resistance, so that the poison may not have such a marked effect.

Symptoms.—This may follow an attack of alcoholic narcosis in a subject of chronic alcoholism. The onset is sudden, with insomnia and extreme restlessness. There may be mental depression, and a tendency to extreme talkativeness. The bodily temperature may be elevated to 101 or 103 degrees, with gastric and intestinal disturbances. The principal symptoms are those pertaining to the mind. The imagination is disordered by delusions, illusions and hallucinations. A delusion is an absurd and unfounded belief. An illusion is a false interpretation of objects that do exist. An hallucination is a sense perception without a physical basis. Among the more common imaginary disturbances is the fear of being pursued by wild animals or reptiles. The patient becomes terror stricken at the pictures on the wall paper and other objects in the room, which he imagines are reptiles or wild animals which will do him injury. The delirium and terror of this condition may be so great that restraint must be used in order to prevent the patient from doing bodily harm to himself. During the entire time of the delirium and hyperactivity of the mind the patient is unable to sleep, which makes him weak and prostrated. If rest cannot be obtained the patient may die of prostration, but if he can fall into a quiet sleep, during which time recuperation occurs, he will awaken much revived, and as elimination takes place, will again be normal.

The adjustment of the atlas and K. P. will so increase the rapidity of elimination and increase the resistance of the brain that the return of consciousness will occur with great rapidity.

Morphine Habit

This habit is usually incurred when the drug is used for medicinal purposes, especially for the relief of pain. When the drug is given in a sufficient quantity it produces a feeling of satisfaction which lasts until it has been eliminated from the body. As soon as the effect has worn off there is a feeling of distress in the epigastric region. This feeling is spoken of by the patient as a pain, but is not a pain, rather it is a paræsthesia or a sensory disturbance which the patient uses as an excuse to obtain the drug.

Adjustment.—By adjusting the atlas, S. P., and K. P., and using the will power to such an extent that the dose can be reduced each time, the habit can be entirely overcome, even in the most severe cases.

Symptoms.—At the beginning the symptoms are slight and hard to describe, the patient's general health being slightly impaired. It may require but a short time for the patient to acquire the habit, and after it is once acquired the patient cannot resist the desire for the drug. If in the attempt to overcome the habit the patient should voluntarily do without it for a time, there will be the feeling of discomfort, nausea, mental depression, and possibly vomiting. The longer the drug is used the larger must be the dose. That is, the body is constantly aiming to resist the injurious effects, and through the adaptation which accomplishes this, the elimination is increased so that it is necessary to take a larger dose in order to have the same effect. As the doses are made larger the effect upon the body is more marked, and the general health is affected to a greater extent. Among the most common disturbances are a loss of appetite and sleep, restlessness, indigestion, mental depression, and weakness of

intellect, so that the patient is unable to concentrate, to hold to his opinions, and often he becomes untruthful. The pupils become minutely contracted when the patient is under the direct influence of the drug, and are dilated when the reaction occurs. There is a gradual and continuous weakening of the mind and body so that the eyes have a peculiar gazing look, the face becomes sallow and the skin is pale, the muscles are thin and weak, and the individual becomes prematurely aged, often dying from extreme weakness.

Acute Opium Poisoning

Definition.—A state of narcosis resulting from the taking of large quantities of opium into the human economy.

Adjustment.—The adjustment should be such that the elimination of the drug will be effected as soon as possible, and this would be given at S. P. and K. P. If the stomach is normal vomiting may take place at once, in which event the narcosis would not occur. If vomiting does not occur, and the dose is taken into the stomach, it will soon be absorbed and carried throughout the body. It would be the K. P. adjustment that would be of importance then. Atlas or axis might also be adjusted so as to increase the resistance of the brain, and help restore consciousness.

Symptoms.—It may be several minutes, or possibly half an hour, after the dose has been taken before the effect becomes noticeable through the symptoms. The height of the coma is reached soon after the onset of the symptoms. The coma is very profound and is characterized by a pale face, though at times it is cyanosed on account of the infrequency of respiration. The pupils are contracted to pin points, the respirations are decreased to from 12 to 4 per minute, the cornea is insensitive to light and to touch, and there is no resistance when an attempt is made to open the eyelids. The heart is weak and the pulse is feeble. At the beginning of the coma the muscles may be in a state of contraction, but they

soon relax, and become flaccid. There is retention of the urine, resulting from the anesthesia of the bladder, which may last for several hours, and if prolonged may give rise to symptoms of uremia. If the dose is large enough the patient will die, and it would be possible to take an amount so great that the adjustment would be unable to give relief. But in the smaller doses an immediate adjustment will be of great service in eliminating the drug, and preventing its narcotic effects.

Lead Poisoning

Definition.—A condition resulting from the absorption or ingestion of lead into the human system in sufficient quantity to overcome the normal bodily resistance.

Adjustment.—K. P. and local. The local depends upon the location at which the lead accumulates. In cases where the lead enters the body through the digestive tract, S. P., and upper lumbar should also be included in the adjustment.

Symptoms.—

(a) "That which is normally made by one animal and transferred to man or another animal becomes a poison to the second animal, because it is not a normal secretion of the second animal."

(b) "That which is made artificially by man and transferred to man or another animal, with the intent of duplicating its normal secretion, is a poison, because it is constituted of elements which are abnormal to man or that animal."

(c) "That which is normally made or secreted but transferred to the wrong place is a poison to the organs for which it was not meant, such as the bile getting into the stomach through the pyloric valve when it properly belongs in the intestine."

(d) "That which is secreted but not excreted, and which gathers in excessive quantity, being dammed back by some obstruction, and is absorbed and carried throughout the body, is a poison. This is well seen in case of diffuse nephritis, where

there is suppression of urine, the suppressed urine being carried over the entire body and infiltrated into its tissues."

(e) "That which is introduced into the human body which does not belong there is a poison. Lead poisoning, as well as opium and morphine poisoning, and alcoholism are types of this form."

Acute Lead Poisoning.—This may be acquired from the drinking of water, wine or milk that has been contained in lead-lined vessels or pipes for any length of time, or in painters who come in contact with white lead, where it is breathed and absorbed through the skin, or it may occur in children who play with toys composed of lead.

The onset is usually sudden, and begins with a severe gastralgic pain situated near the center of the umbilical region and radiating outward from this point in all directions. This pain may closely resemble that of gastralgia or enteralgia. There is vomiting of a very persistent character, and also diarrhœa, the abdomen is tender and often distended, and occasionally there may be convulsions. The pain is paroxysmal, and is commonly spoken of as lead colic. The pain is supposed to result from the pressure upon the nerve endings in the stomach or intestines by the lead which has become deposited in the walls of these organs.

The chronic form results from the slow absorption of small quantities at a time, the process going on for a long period of time.

The symptoms of chronic lead poisoning may be classified into five groups, as follows:

1. Disturbances of nutrition, with a blue line on the gums.
2. Lead colic.
3. Arthralgia or pain in the joints.
4. Palsies or paralysis.
5. Encephalopathy.

The symptoms of the chronic form gradually occur and increase, affecting different portions of the body, according to

the point at which the lead is deposited and the quantity of lead absorbed or ingested. If the body was in a normal state the lead would not accumulate, but would be eliminated from the body as soon as it was absorbed. The accumulation is due to local subluxations which weaken the part and decrease its cellular activity. Among the **nutritional disturbances** which are often the first to appear in the chronic form is the pallor of the skin, which indicates a deficiency of red cells or hemoglobin in the red cells. The patient becomes emaciated, and his muscles become thin and flaccid. Along the border of the gums there is a dark blue line which cannot be removed by rubbing, as the line is in the tissue of the gums, and not deposited upon the exterior.

The mouth is constantly dry and has a metallic taste, the tongue is coated, and the breath has a fetid odor. There is usually gastric and intestinal disturbances, and there may be attacks of lead colic during the early stages. The colic is severe, as in the acute form, and is frequently accompanied by diarrhoea and vomiting.

The arthralgia occurs when there is a deposit of lead in the structures around the articulation. The joint swells, becomes red and the motion is hindered. Deformities may occur, as there is inflammation, which causes a softening of the bone and formation of false exostosis.

Paralysis occurs with the greatest degree of frequency in those cases in which there is arthralgia. The lead is believed to become deposited in the sheath of the nerve and in the nerve endings, affecting the nerve so that the muscle fails to receive its proper amount of impulses or vital force, hence the development of paralysis. The muscles undergo atrophy and are flaccid. De R. becomes apparent, and because of the stretching of the ligaments a partial or complete dislocation may occur. The skin is cool and dry, the extremity is tender upon palpation, and there may be a slight tremor in some cases. The paralysis may affect any or all of the muscles of a part.

Encephalopathy results when the lead reaches and is deposited in the brain so that it effects a poisoning of certain brain centers, thus giving rise to certain groups of symptoms. It occurs in but a very few cases of lead poisoning. Predisposing this encephalopathy there is the existence of an atlas subluxation which weakens the brain and permits the effect of the deposit of the metal. The patient may have delirium, coma, or may pass into convulsions. The delirium may be either mild and muttering, or wild, and the patient may act maniacal. In most cases it is paroxysmal, with intervals of rest and sleep. Often after a prolonged sleep recovery may take place. The coma is sudden and may occur without any attending symptoms. Convulsions are one of the most common symptoms of this form of lead poisoning, and occur when a quantity of lead is deposited in the motor area of the brain, or deposited elsewhere at a point where it is capable of producing pressure upon this area. The meninges covering this motor area is a frequent site, and the convulsions produced are similar to epilepsy. The convulsions are associated with mental dullness, and are followed by the coma as described previously.

Arsenic Poisoning

Definition.—A form of poisoning resulting from the entrance of arsenic into the human body.

Adjustment.—Local, and K. P.

Symptoms.—The same explanation as given in alcoholism and morphine habit will hold here. Arsenic poisoning frequently occurs from an overdose given for medicinal purposes, but since it is the active principle in paris green, and is used in the making of wall paper, it may enter the body through the respiratory tract or be absorbed through the skin. Arsenic, unlike many other poisons, will accumulate in the body, but does not scatter. Therefore, it may require a long period of time for sufficient arsenic to accumulate to produce any symptoms.

The acute form begins suddenly in cases where the drug has been used for medicinal purposes, and is characterized by intense epigastric and abdominal pain, severe vomiting, diarrhoea of bloody and offensive stools, retraction of the abdominal muscles, tenesmus, dryness of the mouth with a metallic taste, and possibly salivation at times. If the quantity of arsenic is large the patient may become comatose, the coma resembling that of opium poisoning.

The chronic form begins with anemia and weakness; the body becomes emaciated, the gums become spongy and bleed easily, there is numbness and tingling in the extremities, and marked pain simulating that of neuritis. As the condition progresses the pain subsides, and paralysis becomes more marked. The paralysis affects the extensors of the foot and wrist, which permits foot drop and wrist drop, the affected muscles are flaccid and are greatly atrophied. The steppage gait is present. It is distinguished from infantile paralysis and multiple neuritis by the history of the use of arsenic, or by a history of the occupation of the patient.

Food Poisoning

Poison is a name given to all substances which when introduced into the animal economy act in a noxious manner on all the vital properties or textures of an organ, or upon the system at large. The body is constantly aiming to rid itself of such substances by a process of elimination, and adapt itself to the transient passage of the substance through the body. That is, if a poison is taken into the stomach which is obnoxious to that organ, *Innate*, if unhindered by subluxation, directs the stomach at once to throw it up or to form such secretion as will neutralize its effect upon the tissues with which it must come in contact before proper elimination. This being done, the stomach acts in accordance with its bidding, and the poison is thrown from the body, having little or no effect upon it, owing to the short time of its pres-

ence. Should there be a subluxation at S. P. hindering the transmission of impulses and impressions to and from the stomach, it would fail to receive the proper information until the poison was given liberty to act; hence the symptoms, which are the manifestations of the action of the poison upon the bodily tissues.

Ptomaine poisoning is one of the most common forms of food poisoning. The ptomaines are nitrogenous, basic substances forming in animal or vegetable matter upon the seventh day of putrefaction, and are commonly met with in canned meats, vegetables, fish and dairy products.

Adjustment.—S. P., K. P., and lumbar.

Symptoms.—The symptoms of ptomaine poisoning are more variable than those of any other disease or condition known. Several people who have eaten of the same food will all present different symptoms. Some may suffer no ill effects at all, others may have a dull headache without additional symptoms, still others may have a pain in the epigastric region with nausea and vomiting, others attacks of diarrhœa or diarrhœa with gastric disturbances, while still other cases may have slight fever, general discomfort, anorexia, vertigo, syncope, cold sweat, abdominal pain, diarrhœa and constant vomiting, with or without convulsions and cerebral symptoms. However, the great majority of cases have gastro-intestinal symptoms. Often there is numbness, tingling, stiffness of the joints, muscular contractions, prostration, and finally collapse.

The great variety of symptoms is due to the different degrees of pressure upon the nerves, which cause a variation in the extent to which Innate can carry out her adaptation. The less the pressure upon the nerves the greater will be the adaptation, and the more moderate will be the symptoms, while if there be a severe pressure but few impulses and impressions will be permitted to pass, and the adaptation will consequently be slight, hence the great severity of the symptoms.

Sunstroke

Definition.—This is also known as insolation and thermic fever, and is an abnormal condition resulting from the effects of the direct rays of the sun upon the body. Heat exhaustion is an abnormal condition resulting from exposure to excessive heat, either natural or artificial. The former presents the symptoms of coma, while the latter is characterized by collapse.

Adjustment.—The amount of heat a person can withstand depends upon the degree to which Innate can adapt the body to this heat. That is, those individuals in which the dissipation of heat is great or in which the thermotaxic mechanism is normal, are practically free from being overcome by heat. The radiation and elimination of heat from the body is mainly through the skin, and the condition of the skin is largely governed by the kidneys, hence a K. P. subluxation might alone be capable of producing a condition in which the perspiration was stopped, thus decreasing heat dissipation and lessening the adaptability of the body to heat. A cord pressure at the atlas or axis might cause a similar condition. Atlas and K. P. is specific in sunstroke or heat exhaustion.

Symptoms.—Sunstroke begins suddenly, with coma; the face is hot and flushed, the skin is excessively hot, the temperature often being 108 degrees, the pulse is strong, steady and bounding, the respirations are deep and labored, the cornea is insensitive, and the muscles may be in a state of tonic spasm. The circumstances attending the condition often are of importance in the analysis; that is, a patient found in a field or otherwise exposed to the direct rays of the sun during an unusually hot day, and having the aforementioned symptoms, usually has sunstroke. Some cases may die immediately or soon after the coma appears, and in such cases the temperature suddenly drops and the symptoms of collapse appear. Many cases that do recover without receiving adjustments are unable to withstand hot weather, or even moderately hot

weather, thereafter. The adjustment at atlas and K. P. will enable the excretory apparatus to accomplish its function, thus increasing heat dissipation and preventing the destruction of vital organs by excessive heat.

Heat exhaustion may occur within a building, in a foundry, or anywhere that the temperature is exceedingly high. The onset is more gradual than that of sunstroke, and begins with dizziness, a feeling of fullness or pain in the head, nausea and vomiting, and a sensation of chilliness or hot flashes along the spine. There is great weakness and a sensation of suffocation. The face is pale and may be bathed in cold perspiration, the temperature may be subnormal, or there may be a slight fever, the pulse is rapid and feeble, the respirations are shallow and quick, the cornea is sensitive, and the pupils may be slightly dilated. Unconsciousness is very rarely met with in heat exhaustion. The adjustment of the atlas and K. P. will increase elimination of poisons and fluid which carry with them surplus heat, thus increasing heat dissipation and lowering the bodily temperature.

SECTION 16

DISEASES OF THE EYE

Hyperemia of the Conjunctiva

Definition.—An overfullness of the conjunctival vessels without great thickening. It is also called dry catarrh.

Adjustment.—Upper cervical.

Symptoms.—This may be a symptom of chronic conjunctivitis, or may be primary in itself. When primary, the predominating symptoms are heavy, hot, painful lids, more pronounced when the ball is moved. There is an increased flow of lacrimal fluid and sensitiveness to light. Upon inspection the under surface of the lids are found to be highly congested and slightly swollen. There is no discharge other than that produced by lacrimation.

Simple Conjunctivitis

Definition.—An acute catarrhal inflammation of the conjunctiva, characterized by a slight swelling of the lids and a mucopurulent secretion.

Adjustment.—Upper cervical and K. P.

Pathology.—The ocular and palpebral conjunctiva become hyperemic and swollen, giving off an exudate of transformed mucus, fibrin and granular debris.

Symptoms.—Catarrhal conjunctivitis may be unilateral or bilateral, and is often associated with coryza. It begins with burning sensations, lacrimation and slight swelling. The inflamed surface gives off a sticky transformed secretion, which often hardens during the night, thus holding the lids fast together. The lids become markedly thickened and their movements are very painful. The eye is sensitive to light, cold and wind. The duration is from eight to ten days and the prognosis is always favorable.

Mucopurulent Conjunctivitis

Definition.—An acute, "so-called highly contagious," mucopurulent inflammation of the conjunctiva, and is also commonly called **pink eye**, or **hemorrhagic conjunctivitis**.

Adjustment.—Upper cervical with K. P.

Pathology.—Begins with a marked degree of congestion of the conjunctival vessels, some swelling and abundant mucopurulent exudate. This is followed by a subconjunctival petechia.

Symptoms.—This form of conjunctivitis is always bilateral, although one eye may be affected before the other. Begins with burning pain in the lids and a thick glue-like secretion from the eye, which cements the lids together during sleep. By the third day the lids are greatly swollen and the ocular conjunctiva is bright red, hence the name, pink eye. This marks the height of the condition. Close inspection will reveal that many small hemorrhages have taken place. The exudate always retains its stringy appearance as it contains much mucin. In about four per cent of the cases there is the formation of a pseudo-membrane, which make the condition resemble diphtheria. The total duration is about ten days, and the prognosis is very favorable.

If the exudate becomes purulent the pus destroys the mucin and its stringy character is then lost. The term purulent conjunctivitis is then applied to this condition, but purulent conjunctivitis may develop in other forms of the disease.

Gonorrheal Conjunctivitis

Definition.—A gonorrheal inflammation of the conjunctiva.

Adjustment.—Upper cervical and K. P.

Pathology.—The conjunctival vessels are engorged early and the superficial layers of the conjunctiva are infiltrated with serum and leucocytes. Later there is a purulent discharge from the free surface.

Symptoms.—This begins with swelling of the lids, which become a dark red hue. There is a gritty sensation with smarting and burning. In three days the height of the acute stage is reached, the lids being enormously swollen. The upper lid often overlaps the lower, and the secretion which at first is thin and watery, becomes thick and purulent, and flows down over the cheeks. The ocular conjunctiva becomes markedly edematous, producing **chemosis**, and the chemotic tissue often overlaps the cornea, giving lodgment to exudate in the sulcus thus formed. The accumulated exudate in its process of decomposition often involves the cornea, causing corneal ulcers. In one or two weeks the acute stage merges into the subacute. In the subacute stage the swelling and secretion are greatly diminished and the conjunctiva is pale and flabby. Use of the eyes still brings on pain with increased secretion. If the condition becomes purulent there are always corneal ulcers, which in the healing process, leave scars, greatly interfering with vision.

Gonorrheal conjunctivitis in the new-born develops within the first three days and is usually called conjunctivitis neonatorum or ophthalmia neonatorum.

Diphtheric Conjunctivitis

Definition.—A severe, acute inflammation of the conjunctiva, characterized by intense swelling, thickening and hardening of the lids, and by the presence of a pseudomembrane.

Adjustment.—Upper cervical and K. P.

Pathology.—Begins with a congestion of the vessels of the conjunctiva, which is soon followed by an exudate of leucocytes and fibrin upon its free surface. This exudate is firmly attached to the superficial cells, and incloses epithelial cells, blood corpuscles and various forms of bacteria.

Symptoms.—In typical cases the onset is sudden. It begins with discomfort, lacrimation and congestion, and within twenty-four hours the upper lid may have attained four or

five times its normal thickness. It becomes shiny and assumes a dusky red color. The lid is hard to the touch, closes the eye completely, and cannot be easily raised or everted. A serous exudate tinged with blood often oozes from between the lids during this stage. There is a sensation of great tension upon the globe, but aside from this there is little pain. Upon raising the lids the pseudomembrane will be found upon the palpebral and ocular conjunctiva. It is gray in color, closely adherent and about one mm. in thickness. Forcible removal of the pseudomembrane will leave a raw, bleeding surface, which is soon covered with a new coat of exudate. The acute stage lasts about seven days, during which time there may be slight fever with its accompanying symptoms. In time the exudate becomes purulent and the membrane sloughs off in small plates until the conjunctiva is clear. Corneal ulcers are the most common complication.

The prognosis is favorable under adjustments.

Granular Conjunctivitis

Definition.—An inflammation of the conjunctiva, characterized by the formation of numerous, oval granulations upon the palpebral conjunctiva. When the conjunctiva is not hypertrophied these granulations resemble frog's spawn, to which they are frequently compared:

Adjustment.—Upper cervical in combination with K. P., but the vertebra taken in combination may be any that will tend to make elimination more normal.

Pathology.—Blood vessels become enlarged, the conjunctiva becomes swollen, and the lymphoid follicles develop into papilla-like projections. Small cysts may develop and scar tissue form as the result of their erosion.

Symptoms.—This disease is also called Trachoma, Granular Eyelids, Granular Ophthalmia, Military Ophthalmia and Egyptian Ophthalmia. Its symptoms are divided into three stages: The first stage may begin like catarrhal conjunctivitis, having more marked swelling, discharge and hypertrophy, or

it may begin with slight thickening of the lids, and abundant development of minute granules which can be seen upon evert-ing them. But most commonly it has a very gradual onset, with redness of the conjunctiva and margins of the lids, which is accompanied by lacrimation, scanty discharge and a burning sensation. The lids may be stuck together upon awakening. By the end of the week the pain and irritation have greatly increased. By the end of the second week the conjunctiva has become markedly hypertrophied and studded with small granules. By the sixth week the hypertrophy lessens, and a marked congestion prevails, which becomes chronic, and gradually merges into the second stage, which is one of commencing atrophy with persistent granulation.

The second stage is commonly called the granular stage. In this stage hypertrophy of connective tissue has passed away, and bands of cicatricial tissue begin to appear. The follicles lose their character and coalesce. Masses of lymphoid tissue cover the under surface of the lids, especially the upper one. The area of the conjunctiva is lessened by contraction of the proliferating connective tissue. The margin of the lids may remain thick and the upper lid droops forming a partial ptosis. There is marked irritation of the cornea, produced by the rough granular lids moving over it. This gives rise to excessive vascularity of the superficial layer of the cornea, which is known as vascular pannus. It may be limited to a small part of the cornea, usually in a severe case involves the entire surface. If this condition is prolonged, superficial ulcers may form with photophobia, spasms of the orbicularis palpebral muscle and tilting of the head forward, and upon the development of this condition, there is but slight exudate and much lacrimation. This stage gradually merges into the third stage.

The third stage is spoken of as the stage of atrophy. All lymphoid tissue has disappeared. The conjunctiva, with the exception of a few localized spots, has lost its function. The cornea is partly or completely opaque, and vision is impaired

or totally abolished. The lids, however, may remain thick, deformed, and have but few misplaced cilia.

The first stage lasts from three months to a year or more. The second stage rarely requires less than ten years to reach the stage of atrophy. In most all cases the patient has reached middle life before the appearance of this stage. The stage of atrophy is usually permanent. The results in the first and second stages under Chiropractic adjustments are good.

Pterygium

Definition.—A peculiar wedge shaped mass of hypertrophied conjunctiva, which develops in the horizontal meridian of the eyeball.

Adjustment.—Upper cervical.

Pathology.—It is composed of loose connective tissue, rich with blood vessels and fatty deposits. The epithelial layer of the conjunctiva is thickened. It is usually preceded by the formation of a small yellowish elevation in the ocular conjunctiva, called a pinguecula. This is later embodied in the pterygium.

Symptoms.—It usually develops at the inner angle of the orbit with the apex extending toward the pupil and the base lying at the caruncle. Its upper and lower borders overlap the conjunctiva and are not attached to it. The apex advances toward the pupil, but does not pass its center. There is no pain unless the structure becomes inflamed, and is most commonly found in male adults, especially those employed as miners, stone masons, laborers and other occupations in which the eye would be subject to injury by small particles of hardened material. Most cases result from minor injuries of this character.

Xerosis

Definition.—A dryness of the surface of the conjunctiva, also called Xerophthalmus.

Adjustment.—Upper cervical and K. P.

Symptoms.—This may be a secretory neurosis of the lachrimal glands, or occur as a result of general malnutrition, but is often symptomatic and due to atrophy of the conjunctiva as in tracoma. It may occur as a mild or severe affection, and is characterized by triangular masses of foamy secretion, not moistened with tears, located at the margin of the cornea. The conjunctiva is lustreless, but may become red, due to the irritation of the dry lid moving over it. It is most common in adults, but may occur in children. The prognosis in mild cases is favorable, but when due to the third stage of tracoma is unfavorable.

Superficial Keratitis

Definition.—An inflammation of the conjunctival layer of the cornea, and is most commonly found in subjects of disordered nutrition. It is called phlyctenular keratitis.

Adjustment.—Upper cervical with K. P.

Pathology.—This condition begins by the formation of a phlyctenule, an elevation resembling a vesicle. On cross section it is found to consist of a collection of small round lymphoid cells, which break down, are discharged and form a superficial ulcer, which is rapidly covered with a fresh layer of epithelium. In most cases there is no permanent defect, unless the ulcer affects the deep structures of the cornea.

Symptoms.—The disease begins by the formation of a small yellowish-white elevation one to three mm. in diameter, which may occur at any place on the cornea, but usually near the margin of the sclerotic coat. There may be two or three of these phlyctenules. The conjunctival vessels, which extend from the caruncle to the phlyctenule, becomes greatly engorged, forming a triangular shaped area of redness, known as a vascular pannus. In mild cases there is but slight discomfort and inability to use the eyes as much as usual. In severe cases, photophobia, blepharospasm, supraorbital or temporal pain and lacrimation are all present. In the ordinary

case upon subsidence of the inflammation the cornea clears up, leaving no visual defect. In the more severe cases the cornea may remain opaque, but this opaqueness will gradually disappear in one to two years.

Suppurative Keratitis

Definition.—An inflammation of the cornea with the formation of pus.

Adjustment.—Upper cervical and K. P.

Symptoms.—The inflamed portion of the cornea becomes swollen and assumes a pearly gray color, which later becomes yellow and spreads more or less. When remaining circumscribed it forms an abscess of the cornea. This terminates by its anterior wall breaking down, discharging the pus, and leaving a corneal ulcer. These ulcers may heal in a few days without leaving the cornea opaque. They can be detected upon inspection. The sides and bottom of the ulcer are covered with a detritus of dead corneal tissue and pus, having a yellowish color. The adjacent parts of the conjunctiva become red and congested, with a marked degree of swelling around the base of the ulcer. At times there is great pain, photophobia and lachrimation. If the ulcer should perforate the cornea the appearance of pus may be seen at the bottom of the anterior chamber, and is known as **hypopyon**. This perforation permits the aqueous humor to escape and the iris falls forward, often becoming adherent to the posterior wall of the cornea, producing what is known as **anterior synechia**. The anterior chamber may again fill up with the aqueous humor, leaving the iris adherent to the cornea in front of it. Should the pus and toxins of the keratitis be absorbed and spread throughout the eye, a condition of panophthalmitis is produced with final atrophy of the entire eyeball. In mild cases the prognosis is favorable under adjustments, but when severe complications with deformity develop the outlook is not good as regards recovery.

When the cornea is the seat of a gradual inflammation, without the destruction of tissue, but with opaqueness of the cornea, it is said to be interstitial or parenchymatous keratitis. Many such cases are believed to result from syphilis, and when associated with this disease often have Hutchinson's teeth and other evidences that would lead one to suspect the disease.

Hordeolum or Sty

Definition.—There are two forms, internal and external. An external sty is an acute inflammation of the hair follicles in the skin of the eyelid. An internal sty is an acute inflammation of the Meibomian glands.

Adjustment.—Upper cervical with K. P.

Symptoms.—A sty begins rather suddenly with edema, redness and an uncomfortable irritation, which becomes painful upon movement of the lid. A hard lump or point or induration is felt near the margin of the lid. At first this lump is red, but within a few days changes to yellow, and the abscess points. In the external variety the pointing takes place through the skin, near the margin of the lid. In the internal variety the pointing takes place upon the surface of the palpebral conjunctiva. As soon as the abscess sac ruptures the pus is discharged and the symptoms rapidly abate. This condition is analogous to acne of the skin, and is most commonly found in young people who are poorly nourished or are the subjects of anemia or poor elimination. The prognosis is very favorable.

Blepharitis

Definition.—An inflammation of the eyelids, affecting principally their margins, and may be simple or ulcerated.

Adjustment.—Upper cervical with K. P.

Pathology.—In simple blepharitis there may be various degrees of severity, ranging from a slight redness with swelling to destruction of normal structures by the proliferated connective tissue. In ulcerated blepharitis there is hyperemia,

swelling and deformity of the lids with the formation of thin crusts, beneath which are shallow ulcers.

Symptoms.—In simple blepharitis or blepharitis squamosa the margin of the lid is bordered with a red fringe and fine bran-like scales from around the roots of the cilia, which drop off when rubbed. There is also a marked tendency for the cilia to drop out, but they readily grow in again. When the scales are removed the underlying skin is red, but not moist or ulcerated. Upon awakening in the morning the lids may be fastened together with a wax-like secretion from their borders. This is readily removed and these cases respond readily to the adjustments.

In ulcerative blepharitis there is great redness, some swelling, much moisture, shedding of the lashes and the formation of crusts. When the crusts are removed the ulcerations can be seen. Many yellowish white spots form, each of which is perforated with a hair. When the hair is pulled out a small round drop of pus will be found adherent to its root. Still deeper is found a small ulcerated base extending into the hair follicles. The eye lashes are removed with very little traction. As the disease progresses each hair follicle is successively involved by this ulcerative process, until they are all destroyed. New lashes may grow to take the place of those having fallen, but they are few, small, misplaced and deformed. As a result of the cicatricial contraction the lashes may become turned backward upon the eyeball, a condition called trichiasis. The lower lid may be everted, due to the contraction of the hypertrophied connective tissue. This permits the tears to flow over the lid. Such an eversion of the lower lid is called ectropion. When blepharitis reaches this stage there is little chance of restoring the lid to its normal condition.

Chalazion

Definition.—An enlargement of the Meibomian glands due to inflammatory obstruction of their ducts, also called

Meibomian cyst, tarsal tumor, tarsal cyst and cystic tumor of the eyelid.

Adjustment.—Upper cervical with K. P.

Pathology.—Begins with the structural changes of inflammation in the Meibomian glands, which obstruct their ducts, preventing the excretion of the sebaceous material. The contents thus retained solidifies and undergoes fatty degeneration, containing giant cells, leucocytes and pus. They may be single or multiple in one or both lids.

Symptoms.—A tarsal cyst may have a sudden or gradual onset. In the former developing rapidly with much inflammation and tenderness, which causes it to resemble a sty in its early stages, but it does not point. The cases of gradual onset develop so insidiously that the patient is unaware of the existence of an enlargement until the same is palpable. The overlying skin is white, and especially is this true when affecting the upper lid, as the tension of the lid upon the enlargement renders its capillaries anemic. Upon palpation it will move freely with the lid, but it is found to be firmly attached to the tarsus. The fact that it does not point and runs a chronic course distinguishes it from a sty. A chalazion is analogous to a wen on the scalp.

Blepharospasm

Definition.—A tonic or clonic contraction of some or all of the fibers of the orbicularis palpebrarum muscle.

Adjustment.—Upper cervical.

Symptoms.—This is a motor neurosis and may affect one or both eyes, and one or both lids of each eye. There are many instances of slight cases characterized by a frequent contraction or twitching of a few fibers in one lid, which can be readily seen by an observer. In the more severe cases the contraction involves the entire muscle, causing the lids to close tightly and violently.

There are two forms of blepharospasm, clonic and tonic.

In the former the spasm is of momentary duration, and consists of a series of forcible, uncontrollable blinkings. In the tonic variety there is a violent closure of the lids, which may persist for minutes, days, or even months. Blepharospasm may be symptomatic of chorea or hysteria, and will increase under excitement. Other cases may be primary, and may or may not be associated with refractive disturbances or other incoordinations of the eye. The adjustment would be in the upper cervical region as the diseases of which it is symptomatic are caused by subluxation in this region.

Ptosis

Definition.—A drooping of the upper eyelid, due to paralysis of the levator palpebrarum superioris muscle, and is also known as blepharoptosis and blepharoplegia.

Adjustment.—Upper cervical.

Symptoms.—Ptosis may be congenital or acquired. When congenital it is usually due to a malformation of the lid, eyeball or orbit. The upper lid may be prevented from raising, due to a thickening or increased weight as might occur in blepharitis, granular conjunctivitis or tumors. It is usually due to paralysis of the levator muscle, which is supplied by the oculomotor nerve. It may be associated with strabismus, in which case they have a common cause. When associated with hemiplegia, and developing with it, is due to an intracranial hemorrhage, which causes pressure upon the origin or path of the third cranial nerve. In bilateral ptosis the peculiar pose of the head, which is thrown back to enable the patient to look under the drooping lids, is strikingly characteristic.

Congenital Anomalies of the Iris

Heterophthalmos is a congenital condition of the irises in which they differ in color. One iris may be blue and the other brown, or one iris may display two colors.

Persistent pupillary membrane is the remains of a membrane which occupied the pupillary field during fetal life. What is seen of this membrane consists of a number of fine pigmented threads, extending from one point of the pupillary margin of the iris to an opposite point of the margin. It is rarely found in both eyes, it frequently occurs in the newborn, but disappears early in life by undergoing atrophy.

Coloboma of the iris is one of the most common malformations met with in the eye, and consists of an oval shaped fissure or gap in the iris, which has the effect of prolonging the pupil in the direction of the fissure, which is usually downward and inward. This condition may be unilateral or bilateral, and is due to incomplete closure of the ocular fissure. The same condition may exist in the choroid, lens and retina. A congenital coloboma can be differentiated from an artificial one from the fact that in the latter there is the absence of a sphincter pupillæ muscle, it having been excised along the margin of the coloboma.

Irideremia or **Aniridia** is a partial or complete absence of the iris. When the iris is completely absent the entire lens can be seen, it being so prominently exposed that even in case of cataract there is still good vision. This is because there is space enough between the edge of the lens and the ciliary processes for light to pass. When the condition is incomplete there is an absence of the iris at certain points, while small segments may be present at other points. When cataract is found associated with aniridia it is usually congenital. Myopia, hyperopia, astigmatism, amblyopia and cloudy cornea are other conditions which are frequently associated. When there is a narrow rim of iris extending from the scleral border it is called a rudimentary iris and is not irideremia.

Discoria is a condition in which the pupil is irregular or faulty in shape and is usually produced by excrescences on its margin.

Mydriasis is a motor disturbance of the sphincter pupillæ muscle, caused by an upper cervical subluxation, which is char-

acterized by persistent dilatation of the pupil. Myosis is a motor disturbance, having a similar cause, and is characterized by persistent contraction of the pupil.

Hippus is also a motor disturbance, characterized by constant dilation and contraction of the pupil or it is clonic spasm of the sphincter pupillæ muscle.

Iritis

Definition.—An inflammation of the iris.

Adjustment.—Upper cervical with K. P.

Pathology.—The iris is thickened, due to an infiltration of serum and round cells and discolored, due to the hyperemia of the blood vessels. The exudate given off from the anterior surface is serous in character. When given off from the posterior surface it is composed of fibrin and leucocytes. When synechia takes place the iris gradually becomes atrophied.

Symptoms.—The iris assumes a reddish color, which is produced by the hyperemia and by the aqueous humor, becoming infiltrated with the soluble coloring matter of the blood. The exudate may be thrown out from the posterior surface of the iris into the posterior chamber, causing adhesions between the capsule of the lens and the posterior surface of the iris, a condition known as **posterior synechia**. When this is the predominating condition it is called **plastic iritis** or **iritis simplex**. This begins with pericorneal congestion that may be slight or so severe that it produces chemosis. The pupil is contracted and does not respond to the usual tests. There may be exudate in the anterior or posterior chambers, making the cornea appear opaque. When the pupillary field is completely filled with exudate it is known as **occlusion** of the pupil. In some cases the entire pupillary margin of the iris may become adherent to the lens, and is known as **seclusion** of the pupil, a severe form of posterior synechia.

When the exudate is confined to the anterior surface of the iris it is called **serous iritis**. The exudate may drop into

the anterior chamber, forming a whitish spot at its bottom, which is called hypopyon. The serous exudate contains some solid substances which become deposited upon the posterior surface of the cornea, making visible granular spots. The aqueous humor becomes cloudy and the patient may complain of misty vision. In this form there is no chemosis or noticeable congestion around the cornea. It is often of a temporary character, and like plastic iritis has a favorable prognosis under adjustments.

When the iris becomes swollen and thrown into folds by a retention of the exudate in its substance it is called **parenchymatous iritis**. The swelling, which is always present in this form, is often circumscribed and presents an appearance of small nodules within the iris. The conjunctiva may become red, swollen and sensitive. A part of the exudate may find its way into the anterior chamber, forming an hypopyon. It is important to remember that the hypopyon of iritis differs from that of keratitis in that it is much thinner, changes its position with every movement of the head, and undergoes such rapid absorption that it may disappear in a few hours. Pain is the most common subjective symptom, and may be localized in the eye, brow or temple. The severity of the pain does not always indicate the seriousness of the iritis, in which it is present. Usually plastic iritis has much more pain than parenchymatous, yet plastic iritis is a much less serious affection. There is considerable lacrimation, photophobia and visual disturbances, varying according to the opaqueness of the aqueous humor and to the amount of exudate in the pupillary field. The prognosis in parenchymatous iritis is not as favorable as in the two preceding forms.

Congenital Deformities of the Choroid

Coloboma of the choroid is an anomaly that is frequently associated with the same condition of the iris. It is usually congenital, but is sometimes brought about by traumatism.

Retinoscopic examination shows the exposed sclera through the aperture in the choroid. It most commonly forms near the optic nerve and may involve the retina as well as the choroid. When the retina is not involved its vessels can be seen crossing over the coloboma of the choroid.

Albinism is a partial or complete absence of pigment in the choroid, and is a congenital deformity. The pupil has a reddish luster and is smaller than normal. The iris appears red because the light is not absorbed owing to the lack of pigment, hence gives a reddish reflection. The vessels of the retina and choroid are plainly visible with the retinoscope. There is usually photophobia and often visional defects.

Choroiditis

Definition.—An inflammation of the choroid coat of the eyeball, which may be exudative or suppurative.

Adjustment.—Upper cervical with K. P.

Pathology.—In the exudative type the vessels are engorged with blood and the surrounding tissues are filled with round cells, and small open spaces containing fibrin may be seen. Hemorrhages may occur, and late in the disease there is proliferation of connective tissue with atrophy of the choroid.

In the suppurative type the choroid and retina are enormously thickened, being filled up with round cells, pigment and coagulated material, which in the suppurative stage causes them to lose their identity. The purulent exudate finds its way into the vitreous body and so mixes with it that the whole body is converted into a homogeneous mass. Upon absorption of the pus it comes in contact with practically all structures of the eyeball, so that in the late stages it may produce a panophthalmitis.

Symptoms.—In the exudative or simple type retinoscopic examination will show yellowish-white spots scattered over the red fundus of the eyeball. Later this yellowish color dis-

appears, leaving white spots, which indicates that the choroid has lost its pigment, exposing the sclera. When there are many small spots of this character the condition is called **disseminated choroiditis**. The vitreous body may contain numerous dust-like spots and floating membranes which produce floating specks before the eyes, or a **scotoma** in the field of vision. There are always visual disturbances consisting of photophobia, loss of acuteness, narrowing of the field of vision and floating specks before the eyes. The disturbances of vision result partly from the opacities in the vitreous body, and partly from the involvement of the retina, which is injured to some extent in most all cases. When the exudate is localized in the macular region it is called **central choroiditis**, and always has marked visual disturbances.

Suppurative choroiditis begins suddenly with redness and swelling of the lids, conjunctiva and cornea. The lids may be swollen closed, movements of the eyeball greatly lessened and the cornea cloudy. A yellowish reflection can be seen in the pupil, which is due to the presence of pus in the vitreous body. Hypopyon and anterior synechia may both be present. The intraocular tension is increased, causing the pupil to be dilated and the anterior chamber may be shallow. There is intense throbbing pain in the orbit and brow. The sight is completely lost and the eyeball finally atrophies. The prognosis of this form is unfavorable because drainage of the pus is difficult without coming in contact with the many very delicate structures of the eye.

Glaucoma

Definition.—An incoordination of the eye, characterized by opacity of the vitreous humor, increase in the intraocular tension and cupping of the optic disc, producing total blindness.

Adjustment.—Upper cervical and K. P.

Pathology.—A variety of conditions may contribute to the production of structural changes observed in the eye, but

whether they be inflammations, congestions or growths the condition ultimately produced prevents normal drainage of fluid from the eyeball. This obstruction often affects Schlemm's canal in the angle of the anterior chamber, so that the exuded lymph cannot be properly drained, but is retained within the eyeball, raising the intraocular tension and causing opacities of the vitreous humor. The following conditions have been observed in eyes having glaucoma: Edema of the cornea; rigidity and fatty degeneration of the sclera; obstruction of the angle of filtration, Schlemm's canal and the spaces of Fontana; atrophy of the iris; atrophy of the ciliary body; fluidity and opacity of the vitreous humor; atrophy of the choroid; destruction of one or more layers of the retina, with its detachment, and excavation of the optic nerve.

Symptoms.—Glaucoma may be primary, secondary or congenital. Primary glaucoma may be acute inflammatory, sub-acute, chronic and simple or non-inflammatory.

Acute inflammatory glaucoma has a prodromal stage which is characterized by mild attacks in which the cornea is slightly steamy, the pupil dilated and sluggish and hazy vision with rainbows around lights. The eyeball may feel abnormally firm under palpation and the retinal arteries may be seen to pulsate under ophthalmoscopic examination. The prodromal stage may last months or years, coming on in attacks of a few days' duration each, with intervals of abatement. During these intervals there are no symptoms displayed, but the patient requires a stronger reading glass than before the attack.

The **glaucomatous attack** comes on suddenly with severe and excruciating pain in the eyeball and corresponding side of the head, which may be accompanied by vomiting, fever and even loss of consciousness, the lids become puffy and the ocular conjunctiva reddened. The hazy vision is most marked near the center of the visual field and sometimes exists in spots. The cornea becomes insensitive and the pupil is dilated, having a greenish reflection from the lens, hence the

word glaucoma, which means sea green. Dilatation of the pupil is not uniform, therefore it is never exactly circular in shape. The iris is discolored and the humors are turbid. The sight rapidly fails until the patient can scarcely recognize objects. Palpation of the eyeball will show a decided hardness. The intensity of the above symptoms begins to subside after a few days or weeks, but the pupil remains dilated and vision poor. The patient may remain in this condition without any change for some time and is said to be in a **glaucomatous state**. After a period of quiet another outbreak occurs, or several successive attacks may occur, after which the sight is totally destroyed, and known as **absolute glaucoma**. The eye assumes a dull, expressionless look, the cornea is surrounded by a zone of slaty hue, the lens and iris are crowded against the cornea, and the tension of the eyeball is excessive. At this stage excavation of the optic nerve reaches the maximum, and with the total loss of sight the pain usually subsides. In some cases of acute glaucoma the patient becomes totally blind with the first and only attack, constituting what is known as **glaucoma fulminans**. After glaucoma becomes absolute tissue changes are manifested in all structures of the eye. The lens becomes opaque and is known as **glaucomatous cataract**. The retina becomes detached, the iris and sclera atrophy, and in time the entire eyeball is greatly decreased in size.

The subacute form presents the same symptoms and mode of onset as the acute, but progresses more slowly and is less severe.

In **chronic inflammatory glaucoma** the appearance of the eye is very characteristic. The dull red color of the sclera, with its swollen veins, the smoky look of the cornea, the irregular dilatation and eccentric position of the pupil, atrophy of the visible portion of the iris, the marked shallowness of the anterior chamber and the greenish reflection from the lens combine to form a picture which once seen can always be recognized. Central vision slowly fades and the visual

field gradually contracts. The disease proceeds until the condition of absolute glaucoma is reached.

In **noninflammatory glaucoma** the onset is the most insidious of all eye diseases. In the earliest stages there are no symptoms. After a lapse of months, perhaps years, there may be slight dilatation and inactivity of the pupil and a slight increase in the tension of the eyeball. This may be accompanied by haziness of the cornea with diminished sensibility. Vision becomes greatly impaired, but central vision may be well preserved until late in the disease, enabling the patient to read fine print, although not able to see to walk. Total blindness comes on suddenly. Cupping of the optic nerve is the most prominent objective symptom, and is present long before total blindness is produced.

Secondary glaucoma is the name applied to a condition in which the cardinal symptoms of glaucoma develop during the course of some other disease or injury. It often occurs in perforating wounds of the cornea, suddenly closed corneal fistula, serous iritis, choroiditis, traumatic cataract, intraocular tumors and contusions of the eyeball. If glaucoma develops in one of the above conditions and is accompanied by hemorrhage the condition would be known as hemorrhagic glaucoma. **Complicated glaucoma** is the name applied to cases of glaucoma that exist at the same time as some other disease of the eye, which does not have an etiological bearing on the glaucoma. The principal of such diseases are cataract, optic atrophy and myopia.

Buphthalmos is the name applied to a form of glaucoma occurring in childhood, in which there is not only increased tension and cupping of the optic disc, but also enlargement and deformity of the eyeball. The cornea may be clear or opaque and is very thin. The pupil is dilated and the lens remains small. The sclera of the eye in the infant is more yielding than in the adult, which accounts for the enlargement and deformity.

Cataract

Definition.—A general term embracing any opacity of the crystalline lense or its capsule. A **capsular cataract** is a thickening or hyperplasia of the capsule of the lens, causing it to be opaque. This may be congenital, primary or secondary. A **capsulo-lenticular cataract** is the name applied to a form in which there is opacity of the lens and capsule.

Adjustment.—Upper cervical with K. P.

Pathology.—Any condition which interferes with the nutrition or osmotic action of fluids in the anterior part of the eyeball or inflammatory conditions of the lens or structures near the lens are capable of producing cataract. The changes occurring in the lens are slow and progressive. At first there is a slight contraction of the fibers of the lens which is followed by atrophy and the formation of irregular interspaces which are filled with large quantities of fluid. Finally the lenticular fibres show cloudiness, transverse striations, fat globules, cholesterin, pigmentation and other signs of degeneration.

Symptoms.—In the early stages the principal subjective symptom in all forms of cataract is the gradual but steady loss of vision. In those cases where the periphery of the lens is first affected by the opacity, vision may remain good until late in the disease. Such an opacity is called **cortical cataract**. If the opacity begins near the center of the lens it is called a **nuclear cataract**, and interferes with vision in its earliest stages. In most all cases there are floating specks, diplopia and alterations in refraction. These are all due to the irregular swelling of the lens substance, which may be so great at times as to produce myopia, which is commonly called the second sight in old age. Among the objective symptoms will be found swelling and bulging of the lens, which presses upon the iris and thus narrows the anterior chamber; photophobia and a discolored pupil, which may be brown, yellow or white. This latter symptom, however, may be absent.

In the first stage the opacities are scattered throughout

the lens in the shape of spots or lines, which radiate toward the center, leaving places between them that are still transparent. In the **second stage**, which is called the stage of swelling, the lens has absorbed more fluid, and because of this enlargement has pushed the iris forward, reducing the depth of the anterior chamber. In this stage opacity becomes complete, and the lens has a bluish-white color. In the **third stage**, which is also called the stage of maturity, contraction takes place and the absorbed fluid is pressed out. The anterior chamber then resumes its normal depth and the iris becomes dull gray or brown in color.

The process of ripening varies from a few months to several years, but the usual time is from one to four years. When the entire substance of the lens has become opaque, when the swelling has subsided, and the anterior chamber has resumed its normal depth the cataract is said to be ripe. This may be determined by illuminating the pupil and carefully observing if a shadow of the margin of the iris is reflected from the lens. If no shadow exists the opacity is complete, but if a shadow is present there is still a transparent reflecting layer of the lens beneath the capsule.

Congenital or juvenile cataract is a rare occurrence and consists of localized opacities in certain layers of the lens between which are clear spaces. Little but a gray blur can be detected by close inspection. Retinoscopic examination reveals a sharply outlined opacity, which is surrounded by a reddish circle, due to reflection from the fundus. There are usually constitutional disturbances, among which are syphilis, rachitis and tuberculosis. About eighty per cent of these cases have some disease having convulsions.

Traumatic cataract results from laceration of the capsule of the lens, and its progress is dependent upon the amount of surface exposed to the torn capsule. If the anterior capsule is torn the aqueous humor is absorbed, and if the posterior capsule is torn part of the vitreous humor is absorbed, causing the lens to swell, become disorganized and opaque.

If the cataract develops following a blow on the head or side of the face or from an explosion, it is termed a concussion cataract.

Complicated cataract may result from disease in almost any part of the eye, and is produced by an extension of the inflammatory changes to the lens.

Senile or hard cataract is also called gray or simple cataract, and usually develops after the forty-fifth year. The cataract may remain stationary, or it may ripen completely in a few months, or there may be times that it ripens rapidly and other times that it progresses slowly in the same case. Both eyes are nearly always affected, but one considerably in advance of the other. The central layers of the lens are normally more dense than the superficial layers and are called the nucleus, while the softer surrounding mass is called the cortex. This difference is more pronounced after the thirty-fifth year, but if the condition of hardening and staining continues at an advance in its rate the center becomes opaque and is called a nuclear cataract. It is rare, however, that the cortex is not involved in this process of hardening and opacity, and when such is the case it is called a cortical cataract. It begins and progresses as previously described.

Secondary cataract includes three varieties, as follows: **Anterior polar** or pyramidal cataract, which usually results from a central perforating ulcer of the cornea, and appears as a conical mass projecting forward from the surface of the lens. It is white in color and visible through the pupil. **Posterior polar** cataract usually results from disseminated chorioiditis. It manifests itself as a star-shaped opacity in the lens, with or without opacity in the vitreous body. It is always associated with a high degree of myopia. **After** cataract is a condition left or resulting from an operation for cataract. The changes occur in the capsule and result from a proliferation of its connective tissue or from a plastic exudate, which occludes the pupil.

Diabetic and albuminuric cataract are forms developing in individuals suffering with these diseases. They are largely dependent for their existence upon diabetes and nephritis, and are often associated with retinitis, due to the same diseases. Many of these cases make very good recoveries under adjustments for these respective diseases.

Hyalitis

Definition.—Inflammation of the vitreous humor and may be suppurative or characterized by the presence of floating opacities in the body.

Adjustment.—Upper cervical with K. P.

Symptoms.—As the vitreous humor has no blood vessels, the signs of inflammation are limited to the adjacent structures and their exudate is forced into the vitreous humor. Most cases are secondary to inflammatory conditions of the choroid, ciliary body, retina or lens, consequently the symptoms of the primary condition are always present. When pus forms in the vitreous humor it is in a circumscribed mass, and can be seen with the ophthalmoscope. It is attended by fever, pain over the eye, loss of sight and finally atrophy of the eyeball. Previous to the loss of vision there is a scotoma in the visual field which corresponds to the opacity in the vitreous humor.

Opacities of the Vitreous

Definition.—Any movable or fixed opacity in the vitreous humor, which causes dark spots or areas in the field of vision.

Adjustment.—Usually upper cervical with K. P., but lumbar with Li. P. subluxations will cause opacities.

Symptoms.—These opacities can be seen by the patient as black spots or areas, which may be movable or fixed. The patient is able to describe their size, shape and position. When the opacities are very small there may be no interference with vision, but when large and fixed there may

be great interference with vision. If pain is present it is quite certain that the opacity is secondary to inflammation in some part of the eye. The ophthalmoscope shows the positive existence of these opacities. Under this inspection it will be seen that when the patient moves the eyeball toward the right the opacity moves toward the left. In this way opacities of the vitreous can be distinguished from those of the lens or cornea, which are fixed and move with the movements of the eyeball. A patient may have temporary dark spots before the eyes, resulting from a neurosis of the retina or optic nerve and not from opacities in the vitreous.

Embolism of the Retinal Artery

Embolism of the central artery of the retina most commonly occurs in valvular disease of the heart, arteritis, nephritis and arteriosclerosis; consequently the adjustment depends upon the condition to which the embolism is secondary as well as the local zone. Upper cervical and K. P. should be included in every case.

Pathology.—The embolus may consist of endothelium, which has sloughed from the inner lining of the blood vessels or heart. It may be granular in nature or may consist of a hyalin plug. The lumen of the vessel may be partially or completely occluded. After the obstruction has taken place the retina, optic nerve and choroid undergo atrophy. The embolus does not always block the central artery itself, but may lodge in one of its branches, in which case the atrophic changes are limited to a small area and may disappear as the collateral circulation is established. In this latter type of cases the vision may remain normal or be but slightly affected.

Symptoms.—The onset is sudden with complete loss of vision, without any pain or other sensory disturbance. When affecting one eye, and this is usually the case, the patient may remain entirely ignorant of his blindness for a considerable time. In other cases the patient may see sudden flashes of light or a few dark rings as vision hastily departs. The oph-

thalmoscope shows a marked ischemia of the retina. The arteries and corresponding veins are small and contain broken cylinders of blood, separated by clear spaces, which can be seen moving sluggishly along. The retina is pale and the optic nerve is nearly white. This contrast is decidedly seen by comparing it with the unaffected eye. A characteristic feature of the disease is that the macula stands out prominently as a cherry red spot, even though the rest of the retina be pale. In the course of several weeks cases having complete obstruction show a decrease in the retinal edema, atrophy of the optic disc, and white lines marking the course of the functionless vessels.

Thrombosis of the retinal artery may occur under the same circumstances as embolism and may form in the main artery or one of its branches. The symptoms and appearance of the retina are the same as described with the exception that they develop gradually.

Thrombosis of the Retinal Vein

Adjustment.—Upper cervical with K. P.

Symptoms.—When thrombosis affects small veins the symptoms consist of a number of insensitive spots on the retina, which produce blind spots in the field of vision. These correspond in size, shape and location to the part affected by the thrombus. Complete thrombosis of the central vein causes great engorgement of the retina, with venous pulse and numerous retinal hemorrhages. In cases of short standing, where the vitreous is still clear, the condition can be readily recognized with the retinoscope, but in time the vitreous humor becomes opaque from absorption of the soluble constituents of the blood.

Simple or Serous Retinitis

Definition.—An inflammation of the superficial layers of the retina.

Adjustment.—Upper cervical with K. P.

Pathology.—In the early stages the principal alteration consists of hyperemia of the retinal vessels with edema and some infiltration of leucocytes into the inner layers of the retina. When becoming chronic there is an overgrowth of connective tissue and atrophy of the retina.

Symptoms.—Retinoscopic examination shows three prominent and characteristic objective symptoms, which are: **First**, edema of the retina. It appears as seen through a mist, has a grayish color, and the vitreous may be cloudy from the infiltrated serum. **Second**, the veins are altered, being distended at some points, and covered by the swollen retina at other points. **Third**, retinal hemorrhages may be seen, but they are small and not numerous in the simple form of the disease. The first subjective symptom to present itself is a loss of the acuteness of central vision associated with contraction of the visual field. If the inflammatory process is localized in a small part of the retina the scotoma will be small and situated in a corresponding part of the field of vision. There is a marked distortion of vision, due to the swollen retina having changed its position. This makes objects look larger or smaller than normal, according to the changes that have taken place. An occasional symptom is the ability to see better by a poor light than by a bright light, and as a rule these cases can see better in the evening after sundown than during the day. Pain is seldom present, even though there be a high degree of inflammation present.

Retinitis, due to concussion and to syphilis, present the same symptoms, but the history of the case is usually sufficient to indicate whether either condition is an etiologic factor of the retinitis.

Macular retinitis is a term applied to any inflammation of the retina which is localized in the macular region.

Parenchymatous Retinitis

Definition.—A form of retinitis involving the deep layers.

Adjustment.—Upper cervical with K. P.

Pathology.—Begins with hyperemia, edema and an infiltration of white cells in the deep layers of the retina. This is followed by absorption of the products of inflammation and partial or complete atrophy of the retina, with abundant overgrowth of connective tissue.

Symptoms.—The arteries are found to be distended with blood, and the optic nerve to be a deeper red than normal. The veins are also overfilled and occasionally have minor hemorrhages into the adjacent structures. These hemorrhages are especially common in retinitis of nephritic origin, and hemorrhages appear as small red spots. When the hemorrhage is large it is most commonly linear in shape and is called hemorrhagic retinitis. There is dullness of vision, increasing at a rather rapid degree, and may result in total blindness if the inflammation is general. If the inflammation is circumscribed there is a scotoma in the corresponding part of the field of vision. Pain is absent, but distortion of objects sometimes exist. If but one eye is affected the condition may be far advanced before detected. This form of retinitis may begin as the serous type, or the two forms of the disease may coexist in different parts of the retina.

Nephritic Retinitis

Definition.—A general term which includes all changes in the retina directly dependent upon some disease of the kidney.

Adjustment.—K. P. is the most important adjustment, but upper cervical may be taken in combination.

Pathology.—The retina becomes hyperemic and edematous. The connective tissue in the deep layers undergoes hyperplasia and finally fatty degeneration, after which the retina may be the sight of numerous hemorrhages.

Symptoms.—In albuminuric retinitis the patient first complains of imperfect vision, which progressively increases. The macula is often the last part of the retina to become affected. This preserves central vision late in the disease. Both

eyes are usually involved to about the same degree. If the case is unilateral it soon becomes bilateral. The ophthalmoscope shows fatty deposits in the posterior part of the retina. These spots are very small and have the appearance of minute dots, which are arranged in the form of a circle around the macula. In the macula itself there is usually one or more of these white spots, from which radiate a number of thin, white, glistening lines. These two signs are considered as the ophthalmoscopic picture of the disease and sufficient to recognize it. Retinal hemorrhages may occur and are usually long or linear in shape, very rarely being dotted or sheet-like. They are due to changes in the arterial walls. The optic nerve is swollen and streaked with enlarged vessels.

The prognosis in cases due to pregnancy is good, but those due to nephritis and arteriosclerosis are less favorable, as statistics show that sixty-two per cent of such cases die within the first year and ninety-three per cent within the first two years.

Diabetic retinitis has the same structural changes as the albuminuric form. The retina after being inflamed undergoes fatty degeneration. The subjective symptoms relating to the eye are the same in all forms of nephritic retinitis, but the constitutional symptoms in this form are those of diabetes. Examination of the eye in diabetic retinitis shows no lines radiating from the macula and hemorrhages are much less common.

Retinal Hemorrhage

Definition.—An effusion of blood from the retinal vessels, and is also called apoplexy of the retina.

Adjustment.—Upper cervical with K. P.

Pathology.—Hemorrhages may occur in connection with retinitis, and is then spoken of as hemorrhagic retinitis, but the condition called retinal hemorrhage more commonly occurs because of changes having taken place in the vessel walls. The changes may be those of fatty degeneration, arteriosclero-

sis, venous obstruction or vasomotor weakness. The hemorrhages may take place in any layer of the retina, but when superficial they leave the retina in a healthy state, and after absorption of the effused blood leave no visual defect. Sometimes the blood breaks through the limiting membrane and passes into the vitreous humor. The macular region is the favorite location for retinal hemorrhages.

Symptoms.—The onset is sudden and the extravasation is apt to be large when no inflammatory condition exists. The patient sees a veil or a cloud moving from above downward, which greatly interferes with vision. It is most common in the macular region, where it can be seen as an irregular or oval blotch with the long diameter vertical. There may be partial or complete blindness, which gradually diminishes for two to four weeks as the blood is absorbed. If absorption is incomplete a scotoma will exist in the field of vision. Oftentimes these hemorrhages will recur, each attack presenting the same symptoms.

Sclerosis of the Retina

Definition.—A hardening of the retina, due to an overgrowth of its connective tissue.

Adjustment.—Upper cervical with K. P.

Pathology.—In the earliest stages there are signs of inflammation with proliferation of the connective tissue, forming the supporting structure of the retina. This is followed by sclerosis of the retinal vessels, with contraction of their diameters, atrophy of the nerve elements and destruction of the rods and cones. In the pigmented form there are pigmentary deposits of various shapes in the retina.

Symptoms.—Night blindness is ordinarily the first symptom to attract the attention of the patient, but changes can always be observed in the retina when this symptom is present. Central vision is lost, the field of vision contracted and myopia present. Often the patient is unable to recognize the

colors red and green. The optic disc is red or gray in color, or may have a glistening tendon-like whiteness, when pigmented; dark spots or areas are seen, especially along the temporal side of the fundus. The pigment is arranged in a peculiar manner, making that part of the retina affected appear to be studded with Haversian canals, which gives it a star-like appearance.

Detachment of the Retina

Definition.—A condition in which the retina and choroid become separated, the former floating in the vitreous humor.

Adjustment.—Upper cervical and K. P.

Pathology.—It may be produced by a stretching of the sclerotic and choroid, they being drawn away from the retina; the retina may be pushed from the choroid into the vitreous humor by a tumor or an accumulation of fluid, which may have exuded from the choroid during the process of inflammation, or it may be drawn from the choroid by changes occurring in the vitreous body and rupture of the retina, which permits fluid to pass in behind it.

Symptoms.—Most commonly there is a fluid behind the retina, which gives it a pale color. Its vessels can be seen plainly as they retain their position in the retina. They appear as dark cords and are smaller than normal. The border of the detachment is sharply outlined by a yellowish or pigmented line. The fluid always gravitates toward the lower portion of the globe, and even though the detachment be at the side or above, the fluid will find its way to the lowest level. Sometimes the detachments are small and have a furrowed appearance. In other cases they are almost circular in shape. The rods and cones become swollen, losing their original structure and function. The ophthalmoscopic picture is not likely to be mistaken for anything else. The detached portion of the retina is of a grayish white color, having wavy folds, which are transversed by vessels and are readily seen

in this light background. When the detachment occurs suddenly the patient notices a dark cloud or mist which he may try to push away. This is the scotoma corresponding to the detachment. The lines on a page appear to be zigzag, widely separated and arranged in a wave-like form. The prognosis is favorable under adjustment, but recovery is slow and gradual.

Papillitis

Definition.—An inflammation of the optic disc or that part of the optic nerve within the eyeball. It is also called intraocular neuritis.

Adjustment.—Upper cervical and K. P.

Pathology.—This is known as a choked disc and presents the signs of simple inflammation, followed by proliferation of connective tissue, sometimes hemorrhage, and finally optic atrophy.

Symptoms.—The optic disc is swollen and raised above the surface of the retina, the larger vessels are readily visible, the veins being slightly distended and the arteries often decreased in size. Small patches of exudate and hemorrhage may be seen in the adjacent retina. The condition of the optic disc may undergo but very little change for a year or more, after which time a condition of optic atrophy supervenes. Vision may vary from normal to complete blindness. If the acuteness of vision varies greatly without any change in the appearance of the disc it indicates that the disturbance is due to intracranial lesions. When vision is good with a choked disc it is of short duration and may be explained by the fact that adaptation may take place so long as the structure of the nerve is not destroyed. The patient may have a scotoma in the field of vision, which is always contracted. Some patients are devoid of the color sense and complain of flashes of light or other subjective symptoms.

Optic Atrophy

Definition.—The name applied to the disappearance of a large or small number of fibers of the optic nerve which have become pale and overgrown with connective tissue.

Adjustment.—Upper cervical.

Pathology.—The structural changes are those of a chronic neuritis, which terminates with proliferation of connective tissue and atrophy of the nerve fibers pressed upon.

Symptoms.—The optic nerve becomes bluish-white or grayish-white in color with clear cut edges. The vessels often show some reduction in size, and if there has been an acute inflammation white streaks of connective tissue can be seen along the larger blood vessels. The optic disc assumes a chalky white color. There are visual disturbances which develop very gradually. Central vision becomes poor and the field of vision contracted. Vision is gradually but progressively lost. A few cases may become stationary at any stage of the atrophy, never becoming totally blind, but always having poor vision. The duration before total blindness varies from three months to about three years.

Amblyopia and Amaurosis

Definition.—Amblyopia means dull eye, and is a term applied to dimness of vision or partial loss of sight occurring without any change in the ocular structure. Amaurosis, which means dark eye, is a term applied to a condition of complete blindness having no pathology.

Adjustment.—Usually upper cervical, but may be of a toxic character as when due to lead, iodine, bromine, malaria and diabetes, in which case K. P. should be included.

Symptoms.—When an eye has never taken part in the visual act to a normal degree it is called congenital amblyopia. In such cases there is usually an early squint, although the positive signs are not present until the child becomes old enough to notice objects both close and at a distance. Am-

blyopia for colors is also called color blindness. It occurs to some extent for certain colors in about three per cent of the entire population, being much more common in men, and is always bilateral. Amblyopia has been known to result when there is uremic poisoning of the visual centers in the brain without producing a retinitis. Examples of this are common in the late stages of scarlet fever, and when occurring is called uremic amblyopia. When accompanying diabetes it is called glycosuric amblyopia. Other cases have been known to occur with loss of blood, as in anæmia or hemorrhage; other cases from worms and digestive disturbances. Amblyopia and amaurosis are recognized by the fact that vision is poor or absent and there are no signs to indicate disease of the eyes.

Eyestrain

Definition.—Is a condition developed by prolonged effort on the part of the accommodating apparatus of the eye.

Adjustment.—Upper cervical.

Symptoms.—When the ciliary muscle becomes tired from prolonged use of the eye at close work, looking at small objects brought near the eye or reading while on a moving car, which causes the accommodation to rapidly change, the patient becomes affected with headache and blurring of vision, which is commonly called eyestrain. This is more especially true if the patient's eyes are myopic or hyperopic. Eyestrain is manifested by failure of near vision after use of the eyes, blurring of distant vision, dilatation of the retinal vessels, redness and swelling of the optic nerve, and congestion of the conjunctiva. There is always headache, which may be confined to the region over or behind the eyes, or may become general over the entire head. This headache may be limited to one side of the head, and as a rule is aggravated upon use of the eye. Patients having eyestrain complain of being nervous, and as a rule are very irritable, peevish and emotional.

Hyperopia

Definition.—Hyperopia is an error in refraction, which occurs when the retina is situated in front of the principal focus.

Adjustment.—Upper cervical.

Symptoms.—On account of the eye having to use some accommodation at all times, when hyperopia exists, it is deprived of its periods of rest which come to the normal eye when fixed on distant objects. As a result of this overwork the power of accommodation will become decreased permanently. At birth nearly all eyes are hyperopic, but it gradually disappears until about the twenty-fifth year, when the lens enlarges. It is claimed that the lens increases one-third in size from the twenty-fifth to the sixty-fifth years, therefore there is a natural tendency for hyperopia to occur to a slight degree during these years. Since hyperopia can be corrected by accommodation it is only the highest degrees that produce symptoms. The earliest sign is a convergent squint and poor vision, with a tendency to hold the printed page close to the eye as in myopia. When the condition is not corrected the individual becomes affected with eyestrain. Far-sightedness can only be detected by the proper eye tests.

Myopia

Definition.—Myopia or near-sightedness is a condition in which the rays of light are brought to a focus in front of the retina.

Adjustment.—Upper cervical.

Symptoms.—High degrees of myopia are much more common than hyperopia. In myopia all objects situated beyond the far point of the eye are indistinct. This indistinctness can be removed or lessened by moving the object closer to the eye, by looking through a concave lens or through a pin hole opening in a card. Objectively the myopic eye appears large and elongated. This change in its shape may be due

to a congenital deformity of the eyeball, but most cases result from some pathological condition of the eye. Weakness of the sclera and an increase in the intraocular tension are especially apt to bring about this deformity. Myopia is recognized by the proper eye tests.

Astigmatism

Definition.—It is a defect in which the rays of light from a single point do not, after refraction, meet at a single point.

Adjustment.—Upper cervical.

Symptoms.—Generally lines can be seen clearly only when they run in some one direction, and this direction is that of one of the principal meridians. When the patient observes a number of lines running in different directions some of them appear very indistinct. It will be found that these indistinct lines lie in the meridian involved. This blurring may be overcome for short intervals by the accommodative action of the ciliary muscles. When the astigmatism exists alone the blurring is not more than one-half as great as that produced by myopia or hyperopia of the same degree. *Astigmatism with the rule* is more common and occurs when the visual defect exists with the meridian of greatest refraction vertical. *Astigmatism against the rule* means that the meridian of greatest refraction is horizontal or nearly so. It is much less common. Irregular astigmatism is the result of disease of the cornea in which its surface is left irregular, having depressions or elevations. This latter condition cannot be corrected by lenses or adjustments.

Presbyopia

Definition.—Presbyopia means the old eye. It is the failure of accommodation with age, which leads to inability to change the optical condition of the eye, so that only rays of a certain convergence or divergence can be focused on the retina.

Adjustment.—Upper cervical.

Symptoms.—When the eye is used in close work for an unusual time symptoms of eyestrain develop, headache, pain in and over the eyes, and congestion of the conjunctiva. If the effort is sustained for some time the ciliary muscles suddenly relax and all near objects become blurred. If the eyes are then rested for a short time the power of distinct vision again returns. Persistent near vision causes frequent failures of accommodation until in time the attempt will stop.

Strabismus

Definition.—It is more commonly known as cross-eye, and is the inability to bring the visual axes to bear upon one point at the same time.

Adjustment.—Upper cervical is the specific adjustment, as this condition is due to involvement of the oculomotor or abducens nerves. They communicate with the first four spinal nerves by means of the carotid and cavernous plexuses.

Symptoms.—Strabismus may affect one or both eyes and is due to paralysis of one or more of the recti muscles. If the eyeball is turned toward the external angle of the orbit it is called divergent or external strabismus, a condition due to paralysis of the internal rectus muscle, which is supplied by the oculomotor nerve. When both eyes are involved by this divergent strabismus a peculiar facial expression is produced, called Hutchinson's face.

If the eyeball is turned toward the nose it is called convergent or internal strabismus, a condition due to paralysis of the external rectus muscle, which is supplied by the abducens nerve. This is by far the most common form of strabismus.

SECTION 17

DISEASES OF THE SKIN

GENERAL SYMPTOMATOLOGY

It is necessary to acquire a definite understanding of the various lesions encountered in skin diseases, as it is the aggregate of these that constitutes the objective changes of those diseases and establishes the basis for their recognition.

These lesions or objective structural changes are divided into two classes, viz., primary and secondary.

Primary Lesions

Macules are variously sized and shaped areas of discoloration characterized by the absence of elevation or depression.

Papules are circumscribed, solid elevations of the skin and vary in size from a pinhead to that of a pea.

Vesicles are slight elevations of the skin containing a clear or opaque fluid. Size, that of a papule.

Pustules are slight elevations of the skin containing pus and are about the size of vesicles.

Blebs or bulla are large elevations of the skin containing a clear or opaque fluid and vary in size from that of a pea to that of a goose egg.

Wheals or pomphi are circumscribed areas of cutaneous or subcutaneous edema of a temporary character.

Nodules are solid elevations of the skin of deep origin and vary in size from that of a pea to that of a cherry.

Tumors are atypical growths of various size, shape and consistence seated in the deep layers of the skin.

Secondary Lesions

Crust is a dried secretion or exudate upon the skin and is usually of a dark color.

Scale is a circumscribed thin layer of epidermal cells which have become detached and are about to be shed. They are light in color.

Excoriation is a scratch mark or a superficial denudation of the skin.

Fissure is a crack in the skin extending down to the corium. Usually located in the folds of the skin over the joints.

Ulcer is an irregularly shaped and sized circumscribed area of necrosed tissue involving a free surface.

Cicatrix is a scar or the effort of Innate to heal a damage to the skin by means of connective tissue. They occur only where the papillary layer of the skin is destroyed.

Six Dermatological Don'ts

1. Don't form an opinion from the history of the case. Note the eruption and all other symptoms, then substantiate it by the history.

2. Don't form an opinion of syphilis because of a syphilitic history. People with syphilis may have other skin diseases.

3. Don't depend upon any one symptom, but let your opinion be guided by the general makeup of the disease as a whole.

4. Don't forget that many conditions of the skin are dependent upon disturbances in the general health of the patient. Therefore—

5. Don't forget to inquire into the performance of the various organs and aim to put the patient in as good a physical condition as possible.

6. Don't encourage the popular notion that there is danger of an eruption "going in," for it never does under Chiropractic adjustments.

Abscess

Definition.—A collection of pus circumscribed by a pyogenic membrane and located in the subcutaneous tissue.

Adjustment.—Local in combination with K. P.

Pathology.—Usually met with as a complication of other skin diseases such as eczema, scabies and acne. Consists of a localized area of hyperemia and swelling into which there is an infiltration of cells which undergo decay, forming pus.

Symptoms.—Abscesses of the skin usually develop suddenly and are small in size except when on the scalp. They form round swellings which are hard or firm to the touch at first, but soon become soft and fluctuate under pressure. When opened they give off a thick pus. They are most common on the scalp with eczema, on the face and back with acne and on the extremities with scabies. They may disappear by absorption or open of their own accord. There is but slight pain and discomfort in cutaneous abscesses. Abscess differs from a boil in that it is not raised and pointed, does not have a central core and is less firm. They differ from carbuncles by the absence of constitutional symptoms, brawny infiltration, intense inflammation and cribiform mode of opening.

They differ from syphilitic gumma in that gumma has no pain, dark red in color, grows slowly, usually multiple, and when cut gives off but little bloody fluid.

Acne

Definition.—An inflammatory incoordination of the sebaceous glands and hair follicles; characterized by a retention of their sebum and an eruption of papules, pustules or nodules upon the face, neck or shoulders.

Pathology.—Acne begins in the hair follicles or sebaceous glands with hyperæmia, swelling and thickening of the wall of the opening through which the sebum reaches the surface. This causes inspissation of the retained sebum and results in the formation of a papule located in the upper part of the

skin. When in this stage is called *acne papulosa*. This may be followed by proliferation of the surrounding connective tissue, the extent of which is variable, forming nodules which are sometimes called tubercles, constituting the lesions known as *acne tubercula*. Finally suppuration takes place in which the gland is destroyed and pus forms, occupying its site, constituting the lesion, which predominates in the stage called *acne pustulosa*. When the skin lesions in acne are largely formed of connective tissue or are surrounded by great thickening of the connective tissue, making them of deep origin and nodular in size, it is called *acne indurata*.

Adjustment.—K. P. Since acne is an inflammatory incoordination involving tissues in many zones it would indicate a dormant condition of lowered tissue resistance which may be irritated or injured by the presence of toxines or excretory material which might be retained within the body because of poor elimination either by the kidneys or bowels, therefore it may be necessary in some cases to adjust in the lumbar region. This would be determined by the history of the case.

Symptoms.—The first stage in all cases of acne is known as *acne vulgaris* or *acne simplex*. It is characterized by the appearance of pinhead or pea-sized papules, which are flat or slightly pointed and situated about the hair follicles. These papules are usually red in color but may have a dark or black center. They may first appear on any part of the body, but most commonly on the face, neck or shoulders. A few pustules may appear early, but so long as papules predominate it is called papular acne. The pustules have a red base with a yellow center and of the same size and shape as the papules. There is no pain in these pustules unless they are bruised by handling or other injury. The skin between the lesions is usually greasy and the pores of the skin very large and often clogged with dirt, constituting the comedo or common black-head.

Acne indurata is a form of pustular acne in which the pustules are large and deeply seated, being surrounded by an

abundance of overgrown connective tissue. They sometimes coalesce and form subcutaneous abscesses which, when open, discharge much pus and leave large scars. This form may exist alone, but usually a few of these indurated pustules are found in cases of acne simplex. After the disappearance of the eruption acne may leave the skin the site of many deep scars, which is called acne atrophica; or acne hypertrophica if the scar has a decidedly raised margin.

Acne artificialis is the result of large doses of bromides, iodides and tar products. Its papules and pustules are the same as previously described. The history of such a case would show the use of some of these drugs. When use of the drug ceases the eruption disappears, hence this is really a skin poisoning or dermatitis.

Acne frontalis is applied to cases in which the lesions are confined to the forehead along the hair-line. Its papules are very small and leave brownish red scars. The course in these cases is usually very chronic.

Differential Symptoms.—True acne differs from acne rosacea in that the latter is confined to the middle third of the face, has but few papules, but great redness and thickening of the skin.

Acne differs from papular eczema in that the latter may be found in patients of all ages, does not occur on the face alone, often found upon the extremities alone, has no comedones and usually has excoriations.

Acne differs from pustular eczema in that the latter is usually found in children, while acne is rarely found before puberty. The pustules are many, they coalesce, form green crusts and run an acute course.

True acne differs from syphilitic acne in that the latter is general in its distribution and always has other evidences, such as the scar of the initial lesion, enlarged lymphatics, uniform lesions, mucous patches, a few months' duration and leaves small white scars.

Acne Rosacea

Definition.—A chronic, inflammatory affection of the nose and cheeks characterized by engorgement of the blood vessels, hypertrophy of the skin and acne-like eruptions.

Pathology.—Acne rosacea begins with hyperæmia and stasis in the capillaries which is followed by hypertrophy of the capillary walls, interrupting the circulation and by inflammation of the sebaceous glands forming papules and pustules. This constitutes the principal changes occurring in typical cases, but occasionally the process progresses with hyperplasia of the connective tissue, which greatly deforms the nose. This deformity is called rhinophyma.

Adjustment.—Middle cervical and K. P.

Symptoms.—The onset is slow and insidious, with diffuse redness of the nose, which is increased upon exposure to the cold. This redness is often transient. The skin of the nose is usually greasy and cold. Later the capillaries become dilated and are plainly visible. Papules develop and may gradually merge into pustules, but these are always few in number. The skin becomes hypertrophied, resulting in dark red, bulky formations, deforming the nose. The latter stage is fortunately rare.

Bromidrosis

Definition.—A condition in which the sweat has an abnormal but distinctive odor.

Adjustment.—When primary K. P. is the adjustment. When symptomatic, such as in hysteria, adjust for the disease of which it is symptomatic.

Symptoms.—Bromidrosis is usually associated with hyperidrosis and often is limited to the feet and axilla, but may be general, as in the negro race. The odor is not always offensive, as cases have been reported having the odor of some flower or drug. Fever has a peculiar odor that could be classed as bromidrosis. This is pronounced in measles. When

localized the affected parts are usually of a pinkish color, may be tender and become sore easily. The odor is due to decomposition of the fatty acids in the sweat.

Chromidrosis is sweat having an abnormal color and may be associated with both bromidrosis and hyperidrosis. It is usually localized in limited regions, predominates in women and may result from the use of drugs. The colors may be yellow, green, red, blue or purple.

Carbuncles

Definition.—A suppurative inflammation of the subcutaneous tissue involving several hair follicles or sebaceous glands.

Pathology.—Begins with localized hyperæmia and swelling of the skin. The sebaceous glands involved become converted into retention cysts. Their contents suppurate and they perforate the skin, forming sieve-like openings.

Adjustment.—Local and K. P.

Symptoms.—Begins with a papule, which within twenty-four hours becomes large, very painful and slightly raised, having an indurated, brawny base. Constitutional disturbances consisting of malaise, fatigue, loss of appetite, headache and rise in temperature develop and persist until the pus is discharged. The pain becomes very severe and is of a throbbing or lancinating character. In ten days the swelling has reached its height. It is then very firm to the touch and may be as much as two or three inches in diameter at the base. The process of softening is marked by several pea-size purulent points, which finally break, discharging pus and from which the core or destroyed gland finally sloughs. These openings may unite to form an ulcer, and as the ulcer deepens the whole mass may fall out, leaving a scar upon healing.

A carbuncle differs from a boil by having a brawny base, greater pain, constitutional disturbances, multiple sieve-like openings and longer duration.

Chloasma

Definition.—An incoordination of the skin characterized by a yellowish-brown pigmentation of various size and shape. It is also commonly called liver spots and moth.

Adjustment.—Usually K. P., but if symptomatic should include local for the condition to which it is symptomatic.

Pathology.—This is considered to be a trophic neurosis of the skin, resulting in increased deposit of normal pigment in localized areas of the mucous layer of the epidermis.

Symptoms.—Chloasma is considered as being idopathic or symptomatic, but from a Chiropractic standpoint would be better considered as primary and secondary. The symptomatic variety being secondary to the disease of which it is a symptom. We have good examples of this in cancer, syphilis, cirrhosis of the liver, malaria and Addison's disease. The primary form may follow irritations of the skin produced by blisters, plasters, scratching or exposure to the sun's rays or wind. The spots are usually yellow or brown in color; they vary in size from a small coin to almost universal discoloration. Spots have irregular outlines, cannot be washed off and have no roughness which can be detected by palpation.

Chloasma uterinum is a discoloration occurring in females between the ages of twenty-five and fifty. It is often seen during pregnancy and in diseases of the uterus causing irritation. The spots have brownish discoloration, may occur over the forehead, temples, cheeks and around the mouth, more rarely on the abdomen and thorax. Occasionally it is associated with leucoderma or patches of white skin in which the normal pigment is deficient or absent. Chloasma can readily be differentiated from diseases simulating it in that they can either be washed off, scraped off or leave the skin a harsh, rough appearance.

Clavus or Corn

Definition.—A corn is a hyperplasia of the corneus layer of the skin having a central core that grows downward into the corium.

Adjustment.—Often this is caused by wearing poorly fitting shoes, which cramp the toes, thus subluxating the first phalanx and can be relieved by adjustment of this articulation.

Symptoms.—They occur upon the toes most commonly and differ from callouses in having a central core that grows down toward the corium. Hard corns grow on the joints, while soft corns grow between or under the toes, where they are kept moist by perspiration. They may become more painful during wet weather on account of being hygroscopic.

A **bunion** may result from an outward displacement of the first phalanx of the great toe, which produces a periostitis with hyperplasia and finally exostosis of the metatarsal bones. The pressure that then results between the exostosis and shoe gives rise to an inflamed bursa, which constitutes the bunion. This may be relieved by adjusting the first metatarso-phalangeal articulation.

Chromophytosis

Definition.—A disease of the skin characterized by brownish variously shaped and sized patches occurring upon the surface of the skin of the chest or other portions of the body.

Adjustment.—K. P.

Symptoms.—This is also called *tinea versicolor* and occurs most commonly between the twentieth and fortieth year. It is supposed to result from a vegetable parasite called the *microsporon furfur*, which does not grow on all skins, but seems to flourish best where the skin is sweaty. It begins with a small yellowish or brown spot, many of which may coalesce to form large patches. These patches are round at first but as they get larger become irregular in shape. The edge of the patch is always definitely marked. When the skin is warm the brown patch presents a pinkish hue and this is also true after bathing or scraping the skin. At times the patch is dry and scaly and at other times it is smooth and greasy. The sternum is the most common location but the

discoloration may extend to the back, shoulders and arms. The number of patches may vary from a few to hundreds and they are not symmetrical. Subjective symptoms are usually absent but there may be slight itching when the skin is sweaty or the patch has been recently irritated.

Dermatitis

Definition.—Dermatitis is an inflammation of the skin.

Adjustment.—The adjustment is to be determined by the character of the case. If a simple localized inflammation resulting from a local irritation the adjustment would be local in the zone affected. If it be localized but the result of a toxic condition K. P. would be important, while if it be associated with high fever and general in its character, C. P. and K. P. should be adjusted.

Pathology.—The structural changes in all forms of dermatitis are that of simple inflammation, viz., hyperæmia, swelling, sometimes suppuration and desquamation varying in degree and extent.

Symptoms.—I. **Dermatitis exfoliativa** is a form involving the whole cutaneous surface and is characterized by redness, dryness and abundant desquamation. It begins with erythematous patches in the folds of the skin. These gradually enlarge until by the third day the entire surface has become red. In rare cases one month may be required before its height is reached. The palms and soles are the last parts to be involved. The skin is dry and bright red at first but during the second week the redness lessens, the skin becomes scaly and desquamation begins. This desquamation is extremely abundant in some instances, the epidermis falling off in large sheets. In other instances the body may be covered with large thin scales having upturned edges. The hair and nails are sometimes shed. The mucous membranes may become inflamed and have increased secretion. At the onset of the diseases there may be high fever of the continued type.

but later in the disease the fever becomes intermittent, being present at night only. There are usually some sensory disturbances consisting of chilliness, stinging, tingling, burning, tenderness and pain, but no itching. The secretion of the sweat and sebum is suppressed. The condition may become chronic with great emaciation and be fatal.

II. When this disease appears in the new-born it is called *dermatitis exfoliativa neonatorum*. In this class of cases there is no fever or digestive disturbance, it beginning with erythema around the mouth, which soon spreads to the trunk and extremities. Desquamation is profuse, occurring in large folds, leaving the skin dry and sensitive. This form usually starts between the second and fifth week of life and lasts seven or eight days. The prognosis is very favorable.

III. *Dermatitis herpetiformis* is a form of the disease in which there is a diffuse herpetic eruption. It begins with prodromal symptoms of malaise, constipation, sensations of heat and cold and slight fever. Itching of the skin precedes the outbreak of the eruption, which may be localized or diffuse. The eruption may be erythematous, vesicular, papular, bullous, pustular or a combination of two or more of these, multiplicity being characteristic. The lesions may be bright red at first but darken with age. When vesicles predominate they are found in clusters, each being the size of a pinhead or pea. When several of these vesicles coalesce they form a bleb or bulla, which may vary in size and shape. The vesicles do not rupture unless injured, this being one of the important distinguishing symptoms from vesicular eczema. When vesicles predominate the disease is called *dermatitis herpetiformis vesiculosa* and is regarded as being the most common variety. When bulla predominate it is spoken of as the *bullous* variety. When papules predominate it is spoken of as the *papular* variety, and when pustules predominate it is called the *pustular* variety.

It is well to remember that erythematous patches with

grouped vesicles, papules, pustules and bulla, intensely pruritic and numerous excoriations always point toward this disease.

This form of dermatitis differs from vesicular eczema by having larger vessels which are grouped in clusters upon a red base and which do not rupture spontaneously leaving a moist surface. Itching is more intense and the duration of the vesicles is much longer.

IV. Dermatitis from the Roentgen Ray is commonly called X-ray burn. It appears weeks or days after the exposure in the form of an erythematous patch having slight swelling. Mild cases may undergo no further change and recover. Severe cases have a deep seated severe pain with numerous vesicles or bulla upon the red patch which becomes purple. The center of the patch becomes moist, ulcerated and does not heal readily. The hair and nails will be temporarily shed and there may be areas of chloasma. The history of the case would show exposure to the X-ray and the patient may have scars from previously healed burns.

V. Dermatitis venenata is a form for the disease resulting from the introduction of poison into the deep layers of the skin. The most common form is called rhus poisoning and embraces the eruptions encountered from poison sumach, poison ivy and poison oak. The mildest cases show a marked erythema with intense itching but the ordinary case is accompanied by considerable swelling, which may occur in the form of a wheal with burning pain. Within a few hours papules, vesicles or bulla develop. The swelling may be intense so that when affecting the face the eyes may be completely closed. The vesicles are usually present in a countless multitude and their contents may either dry up or be discharged upon the skin, where it dries and forms crusts. The redness and swelling slowly disappear as crusts form and the skin soon becomes normal. There is but a small percentage of people who are injured by the poison from these plants.

Dermatitis venenata differs from eczema in that it more often affects all surfaces of the fingers, hands and face; by

having great swelling, more acute onset, greater number of crowded vesicles and its occasional occurrence in streaks which is suggestive of striking against the plant.

VI. *Dermatitis calorica* is the name applied to inflammation of the skin produced by burns or frost bite. When due to the former it may be the effect of natural heat and is called sunburn, the damage to the skin being slight, but when burns are more severe they are characterized by not only hyperemia but also large vesicles or bulla, and when there is complete destruction of the skin as by scalding it is followed by gangrene and sloughing. Burns that involve one half of the cutaneous surface are generally fatal. When dermatitis results from frostbite it may be slight as is commonly seen in the condition called chilblain, which is accompanied by a sensation of heat, smarting or burning, all of which are aggravated by dampness and cold. In the more severe cases the tissue may be destroyed and slough as the result of gangrene. The structural changes due to extreme cold being the same as those due to extreme heat.

Dermatitis is said to be traumatic when due to injury and is spoken of as *medicamentosa* when due to drugs. The *modus operandi* of each differ in different cases so that no given set of symptoms could give a definite picture of any case. The history of these cases is usually sufficient to arrive at a correct conclusion.

Eczema

Definition.—Eczema is an inflammation of the skin characterized by any or all of its results, at once or in succession, such as erythema, papules, vesicles or pustules, terminating in a serous discharge with the formation of crusts, or in desquamation. It is also called *salt rheum*, *tetter* and *scall*.

Adjustment.—K. P. Occasionally Li. P. or Spl. P.

Pathology.—The structural changes begin with hyperemia and swelling of the skin from which there is a serous exudate. If the exudate is profuse and the skin resistant

vesicles form; if the vesicles contain cells they undergo suppuration forming pus, which transforms the vesicle into a pustule; if the serous exudate is scanty and does not break through the epidermis, dry scales form, constituting the condition called *eczema squamosum*; if upon removal of the crusts the corium is exposed it is called *eczema rubrum*; and in the chronic form in which the skin becomes thickened and hardened from the overgrowth of connective tissue it is called *eczema sclerosum*.

Symptoms.—*Eczema* is the most common of all skin diseases and its most prominent symptoms are redness, itching, infiltration, tendency to moisture, crusting or scaling and cracking of the skin. Four or more of the above symptoms are found in all cases and as a rule the disease tends to form in patches which may be localized or general. When general it is called *eczema universalis*. No form is clear cut and unchangeable but gradually merges from one stage into another constituting the various forms.

Eczema erythematosum begins as an enlarging macule, having an irregular outline, red in color and situated upon the face. It may spread to cover the entire face or several similar spots may form which finally unite. Swelling which may be slight or very great is always present. There is intense itching and burning together with other sensory disturbances, the most annoying of which is the feeling of stiffness. In the beginning the macule is bright red but it darkens with age. This type of *eczema* is always dry, except when two surfaces come in contact where due to the irritation they are kept moist. In the course of a few days or weeks the affected area becomes covered with dry scales, from which it obtains the name *eczema squamosum*.

Eczema papulosum begins with round pinhead sized papules which are red in color and very numerous. They may be discrete or confluent and intermingled with vesicles. Itching and burning is very intense and the skin may be covered with excoriations due to the scratching. When the vesicles

break the discharged serums dry upon the skin, forming crusts which are usually yellowish or brown in color except when blood is intermingled with the serum, when they will be black in color. The extensor surfaces of the arms and legs are the favorite locations.

Eczema vesiculosum begins with burning pain, redness and swelling which is followed by the development of a multitude of minute vesicles, which may be discrete or confluent. The vesicles rupture of their own accord, causing a moist surface which upon drying forms a yellowish crust. New crops of vesicles form and undergo similar changes until ultimately the affected portion of the skin is completely covered by the crust. Upon removal of the crust the corium which is a bright red color is exposed and the condition is then referred to as **eczema rubrum**. This is the most common of all forms of eczema, both in children and adults. It has no favorite location except in children, where it is most commonly found upon the cheeks.

Eczema pustulosum begins in the same manner as the vesicular form with numerous small vesicles which are transformed into pustules. The pustules break down rapidly, forming greenish crusts. These lesions occur in patches which may or may not coalesce. Itching is present to a less extent than in the previous forms of eczema. It is common upon the face and scalp of children.

Eczema squamosum is a clinical variety often constituting the terminal stage of erythematous, papular, vesicular and pustular eczema. It is characterized by flat, thin, papery-like scales. The skin may be thickened and occasionally fissured. It is usually chronic and may remain in this stage indefinitely.

Eczema rubrum is also a clinical variety which results from vesicular and pustular eczema. At some time during its development the skin is covered with a thick yellowish-green crust, which upon removal exposes a bright red tender skin that bleeds easily. This red surface may again become covered with a crust as before. When the skin is covered with mois-

ture in this stage it is often called **weeping eczema**. When the surface becomes dry it is soon covered with thin scales constituting squamous eczema.

Infantile eczema is most commonly the pustular form and in its earlier stages it is often called milk crust. It begins with a crust formed of sebum, epithelial debris and pus. When the crust is raised the scalp is found to be red, thickened and moist with a purulent secretion. There are moist spots behind the ears with a red eruption. It next involves the skin of the face, which begins as vesicular eczema with much moisture and crusting. The crusts are of irregular thickness and beneath them the skin is very red. A narrow margin of skin around the eyes and mouth is free from the eruption.

Seborrheal eczema is a form of eczema occurring in the scalp of adults and constitutes one of the forms of dandruff. The onset is insidious for months or years, with scaliness, itching and gradual loss of hair. Scales mix with the sebum to form fatty crusts which are easily removed. It may gradually spread to other parts of the body, but is usually confined to the head. When eczema is limited to any one part of the body, it is often given a name indicating the part affected, such as *eczema capitis* when on the scalp; *eczema palpebrarum* when affecting the eyelids; *eczema manuum* when affecting the hands, or *eczema intertrigo* when occurring in folds of the skin where two surfaces come in contact. These names do not suggest a difference in type of the disease present but merely indicates the location.

Elephantiasis

Definition.—It is a hyperplasia of the skin and subcutaneous connective tissue in which there is obstruction of the lymphatics and is characterized by enormous enlargement of the part affected. It is also called Barbadoes leg, tropical big leg and lymphædema.

Pathology.—This is produced by obstruction of the lymphatics from chronic inflammation, growths, thrombi or in-

flammatory swelling and is attended by congestion, swelling and proliferation of the connective tissues, in muscles, vessels, nerves, lymphatics and skin.

Adjustment.—Local and K. P.

Symptoms.—This may begin suddenly with fever or gradually with an erysipelas-like swelling. The rise in temperature is called elephantoid fever and is accompanied by lumbar pain, nausea, vomiting and sweating. Most sporadic cases begin without fever but with signs of local inflammation in the deep layers of the skin, veins or lymphatics as is evidenced by the redness and swelling. There is a milky exudate that exudes from the skin and may be accompanied by eruption of vesicles containing lymph. In time the acute symptoms will disappear but the leg does not return to its normal size. In the early stages there is pitting of the skin on pressure. There may be one or more recurrent attacks with an increase in the enlargement during each attack. Finally the part attains enormous size. Its contour is lost, its surface smooth and shiny, folds of the skin obliterated and its color becomes dark. Some of the lymphatics may become varicose and may rupture, discharging a clear or milky fluid which appears to sap the patient's strength. Odor of sweat and decomposing fluids is very offensive. The most common location is the lower extremities, one or both, but also affects the genitals, arms, face, ears, breast and tongue. The lymphatic glands may become enlarged. Eczema with intense itching may develop. The disease is rarely fatal.

Epithelioma

Definition.—A chronic progressive malignant growth of the skin or mucous membrane characterized by the formation of ulcers with raised hard waxy edges recurring after removal.

Adjustment.—Local and K. P.

Pathology.—It has a fibrous stroma containing blood vessels and lymphatics upon which are situated numerous

epithelial cells which also infiltrate the deep layers of the corium. This growth undergoes degeneration, is of a malignant character and may be the seat of much ulceration which progressively destroys the tissue in which the cancer is situated.

Symptoms.—Epithelioma often occurs upon old scars, moles, warts, fissures, pimples, scaly spots or insidiously, and most often occurs upon the face, especially the lips, eyelids and nose. The enlargement may begin in the shape of one or more small, hard, red, waxy looking papules with or without itching and pain. After a time the surface of the growth becomes the site of an ulcer which gradually deepens through the skin into the muscles and bones.

The epitheliomatous ulcer is irregular in shape with raised waxlike edges. The floor of the ulcer is uneven and bleeds easily. It is covered with a brownish crust or a purulent secretion. The neighboring lymphatics are enlarged early in the disease and ultimately may break down and ulcerate. Epithelioma may occur singly or in groups. They usually attain a larger size than the visceral carcinoma. When the cancer spreads from a narrow base it is spoken of as the cauliflower variety. In this variety there are deep fissures which give off an offensive discharge. The principal subjective symptom is pain which may be intermittent or continuous and varies in severity. The duration varies with the degree of malignancy. Over fifty per cent of this form of cancer grow upon the lower lip.

Rodent ulcer is classed as a form of epithelioma of low malignancy. Pathologically there is no special distinction between rodent ulcer and carcinoma except that in the ulcer the growth of cells is greater beneath the skin than above and the direction in which it extends is always perpendicular to the skin. It most commonly occurs after middle life and upon the upper half of the face, especially at the root of the nostril and side of the nose. The ulcer is round in shape, from one to three inches across, progresses very slowly, is painless or

nearly so and has gnawedlike edges. It may exist for years before the terminal stage is reached which is characterized by emaciation, weakness and cachexia.

Erythema Roseola

Definition.—A form of primary erythema most common in children characterized by irregular shaped and sized macules of a few hours duration.

Adjustment.—S. P. or lumbar, with K. P.

Symptoms.—This form of erythema is most common in children but affects people in all ages. Nearly all cases follow or arise as a result of digestive disturbances. It begins with a rise of temperature, coated tongue, restlessness and anorexia. Fever is accompanied by red blotches of various size and shape which may be localized or general and which lasts but a few hours to one day. The condition may last several days with new blotches appearing upon other parts of the body. The short duration of the blotches with digestive symptoms makes the recognition easy.

Erythema Multiform

Definition.—An inflammatory disease of the skin characterized by symmetric red macules, papules and vesicles of various shape and size running an acute course.

Adjustment.—C. P. and K. P.

Symptoms.—This is believed to be an angioneurotic disturbance produced by some toxic irritant in the circulation, a condition resulting from poor elimination. The only structural changes occurring are those mentioned in the definition. The disease begins with feverishness, malaise, aching pains and anorexia, which are followed by sudden eruptions of macules, papules, vesicles and sometimes blebs. No part of the body is exempt from this eruption but it is most common on the extensor surface of the extremities. The eruption is attended by

intense itching and burning pain which are constant. One characteristic feature of the disease is that always two or more forms of eruption are present. Occasionally the eruption is confined to the skin over the joints around which there has been rheumatoid pains. The fever subsides upon the appearance of the eruption. The duration is from one to four weeks and the prognosis is always favorable.

It is most common in spring and autumn and is often described according to the eruption which predominates. When papules predominate it is called **erythema papulatum**. When the papules enlarge to the size of tubercles it is called **erythema tuberculatum**. If the lesions continue to enlarge the center becomes depressed, forming a ring-shaped figure and is called **erythema circinatum**. If several such rings form by successive exudation it is called **erythema iris**.

Erythema Nodosum

Definition.—An acute inflammatory condition involving all elements of the skin characterized by strictly defined rounded or oval tender swellings most commonly met with on the shins in young women.

Adjustment.—K. P. and lower lumbar.

Pathology.—The changes are those of acute inflammation of all tissues of the skin with dilated lymphatics, congested vessels and small cell exudation.

Symptoms.—This begins with malaise, fever and unusually severe pain in the legs and is soon followed by the appearance of nodular red swellings varying in size from that of a small nut to an egg upon the anterior surface of the tibia. They are firm under palpation and extremely tender. Upon undergoing absorption they look like a bruised spot. They may vary in number from one to twelve and usually last from two to four weeks. The prognosis is very favorable.

Favus

Definition.—A disease of the skin characterized by discrete or confluent, circular, pale, sulphur-yellow or asbestos-like grayish crusts.

Adjustment.—K. P. is the most important adjustment, but other adjustments to increase the elimination may be made.

Symptoms.—This begins as an erythematous patch or as a group of small vesicles, smaller than those found in ordinary ring worm, upon the scalp or non-hairy parts of the skin. They undergo rapid changes forming yellow crusts around the hairs. The hair becomes dull and lusterless and falls out in places, leaving irregular bald spots of red skin. The crusts have rounded edges, are cup shaped and sulphur-yellow in color. One or more hairs grow out of the center of the crust, which is about the size of a split pea. As the crusts become aged they turn grayish in color and have a peculiar odor of mice or old straw. These crusts may remain discrete or coalesce and are always situated around the hair follicles. The edges of the crust finally become detached and raised. When removed they leave a moist, red surface. They are firm to the touch and crumble between the fingers like mortar. The hair is often dry, split and easily pulled out with its roots. Itching is the only subjective symptom. Pustulation does not belong to this disease but may occur as a complication. The cup shaped, sulphur-yellow crusts are pathognomonic of favus and is also the most important differential symptom from simulating disease. This is also called honeycomb, ringworm and porrigo.

Fibroma

Definition.—Fibroma is a soft tumor of the skin composed of a hyperplasia of the cutaneous and subcutaneous connective tissues.

Adjustment.—Local in combination with K. P.

Symptoms.—Fibromas are most commonly found upon the trunk. They may be pink, brownish or normal in color, and round, flat, or pedunculated in shape. They are always raised above the surface of the skin and are of a soft consistence upon palpation. They may have small tufts of hair growing from them or they may be perfectly smooth. They vary in number from one to hundreds, but when numerous are found distributed in many parts of the body. They have no subjective symptoms and cause the patient no inconvenience unless they attain enormous size. As a rule they are the size of a cherry or even as large as a walnut, but may become as large as a child's head. They always grow slowly and after attaining a certain size remain stationary. When they are pedunculated and hang down like polypi are called *fibroma pendulum*. They differ from lipoma in not being lobulated and in projecting above the level of the skin. Lipoma is encapsulated beneath the skin.

Furunculus

Definition.—An acute suppurative inflammation around a cutaneous gland or follicle, characterized by one or more painful formations terminating in necrosis.

Adjustment.—Local and K. P.

Pathology.—The inflammation begins in the corium, in or around the hair follicle or glands of the skin with hyperemia, swelling, induration, suppuration and discharge of pus. After the pus is discharged granular tissue forms, leaving a scar.

Symptoms.—Boils most commonly appear upon the neck, face, forearms, buttocks and legs. They begin as a small, round, red painful spot which progressively enlarges until the fourth or fifth day, when it develops into a papule the size of a pea to that of a quarter of a dollar. This papule is raised above the level of the skin, is dark red in color at the center and light red at its edge. There is great tenderness with

some throbbing pain. In a few days the center becomes yellow, indicating the formation of pus. Upon perforation of the skin bloody pus and a core of a greenish color is discharged, leaving a cavity which is later filled by scar tissue. If supuration does not occur the papule does not point and is called a **blind boil**. Boils may occur singly or in great numbers. When numerous the patient is said to have **furunculosis** and has fever, chills, sweats and enlarged lymphatics. Boils affecting the sweat glands are less common, are smaller in size and are often of the blind variety.

Herpes

Definition.—An acute inflammation of the skin characterized by an eruption of one or more groups of vesicles situated upon a red base.

Adjustment.—Since herpes is usually symptomatic the adjustment should be made locally, depending upon the causative disease.

Symptoms.—**Herpes facialis** is the most common form and is so named when occurring upon any part of the face. It is commonly called cold sore, fever blister, herpes febrilis and herpes labialis. The patient first notices a burning, itching or stinging sensation in the affected part, which is also erythematous. This erythematous patch is soon covered with a multitude of minute vesicles. There may be more than one such patch but they are always few in number, while the vesicles upon the patch are numerous. In a few days the vesicles dry up and form a crust, which is soon shed without leaving a scar. Herpes may form upon the lips, around the nose or eyelids. Herpes is symptomatic of respiratory catarrh, fever or gastric disorders.

Herpes progenitalis is that form occurring upon the genitals. They begin with a similar burning, itching and stinging with a reddened base, upon which soon appears numerous small vesicles. These vesicles are always isolated and not

confluent and vary from eight to thirty-five in number. There may be a swelling of the groin glands. About eighty per cent of herpes progenitalis is found in women during menstruation and lasts from eight to ten days.

Ichthyosis

Definition.—A localized or general disease of the skin characterized by dryness, harshness, scaling and sometimes by warty looking growths.

Adjustment.—K. P.

Symptoms.—**Xeroderma** is the simplest form of the disease. It is characterized by dryness, harshness, scaliness and grayness of the skin with pronounced lines running across the trunk or extremities. This may be limited to the extensor surfaces of the extremities or may become general over the entire body. The secretion of sweat and sebum is suppressed, hence the dryness.

Ichthyosis simplex is a more severe form in which the skin is dry, scaly and divided into small squares or diamond shaped figures. It is more often localized upon the extensor surfaces of the extremities. The face, palms, soles and scalp are usually not affected, while the elbows and knees are most often involved. The skin is thrown into folds, between which are small superficial fissures, giving it the scaly appearance from which it obtains the name fish-skin disease. The scaly patches have upturned edges and depressed centers, the hair is dry, the nails may be pitted and the patient is very sensitive to the cold. These cases are aggravated by the cold during cold weather and are less severe during warm weather.

Ichthyosis hystrix is a very rare form which is always localized and usually unilateral. It often follows the course of distribution of a nerve which would indicate the adjustment of the local vertemere. It is characterized by horny papillary growths, pin point in size, which may be massed together into elevated, warty-like plates of dark green color and transversed by deep lines or fissures that may be arranged

into parallel lines. This form of ichthyosis is sometimes called neurotic papilloma.

Ichthyosis congenita is also called keratosis and keratoma follicularis. The condition is present at birth and is a very rare occurrence. The skin is covered with fatty-like plates or scales which are cracked in all directions. The deep fissures which exist in the skin extend down to the corium. The lips and eyelids are often immovable, the feet may be deformed and the skin is yellow or gray in color. Most of these cases are born dead or soon die. The prognosis under adjustments is uncertain.

Impetigo Simplex

Definition.—A disease of the skin characterized by an eruption of pustules that are pustules from the beginning.

Adjustment.—C. P. and K. P.

Symptoms.—The onset is with malaise, anorexia, constipation and feverishness. The eruption consists of one to a dozen pustules that are pustules from the beginning. These pustules are about the size of a split pea; they have thick walls, are not fully distended, have a very small areola without induration, have no central depression, do not rupture and are yellow in color. They usually occur upon the face, hands and feet and are much more common in children. There is no burning or itching, it is not contagious and leaves no scar or pigmentation. The duration is a few weeks and the prognosis is favorable.

Impetigo Contagiosa

Definition.—An acute inflammatory disease of the skin, occurring upon exposed parts as a rule and characterized by vesico-pustules or bulla.

Adjustment.—C. P. and K. P.

Symptoms.—The onset is with slight febrile disturbances and is followed by an eruption of vesicles and pustules occurring in successive crops. The lesions vary in size but

average that of a split pea and are at first surrounded by a red areola or halo which soon fades. The pustule gradually increases in size and sometimes assumes an annular shape. They are not fully distended, but flaccid and resemble a burn. In a few days the contents dry up, forming a crust with up-turned edges. Rare cases have large bulla several inches long and of irregular shape, which become purulent. These bulla are formed by two or more vesicles coalescing. They have depressed centers and last much longer than the pustules. Impetigo contagiosa most commonly affects the chin and hands of children; it has no definite course and is often epidemic.

Differential Symptoms.—Impetigo differs from pustular eczema in that eczema has intense itching, its pustules soon break down, forming dark green crusts, and the pustules in eczema are smaller and much more numerous.

It differs from smallpox by the absence of high fever and backache, absence of papules and progressive changes, absence of pitting, absence of definite duration and in that its vesico-pustules are localized.

It differs from pemphigus in that the latter occurs in adults; is not contagious; is more general in its distribution; is very chronic in its course; tends to return from year to year; its bulla are fully distended; has no areola and the prognosis of pemphigus is less favorable.

Impetigo Herpetiformis

Definition.—A very rare form of impetigo characterized by grouped pustules in localized areas of the skin.

Adjustment.—C. P. and K. P.

Symptoms.—This form of impetigo is found almost exclusively in women. It begins with an eruption of pustules which are grouped in small patches upon the breasts, axilla and groin. These pustules are pinhead in size and upon drying form brown crusts, around which new pustules form, thus enlarging the surface affected. Within three or four months the whole surface of the skin is swollen, red, hot and cov-

ered with brown crusts showing torn and excoriated places. There is a continuous remittent fever from the beginning and each outbreak of pustules is marked by severe chills and high fever. Emaciation and weakness progressively increase. The prognosis is uncertain as few, if any, cases have been adjusted.

Keloid

Definition.—Keloid, which is also called cheloid, is a connective tissue growth of the skin occurring most commonly upon the chest, its characteristics being hardness, pink color and prolongations extending in all directions.

Adjustment.—Local and K. P.

Symptoms.—Keloid is most common after puberty in the negro race and consists of a fibrous growth of dense consistency resembling scar tissue. Most cases have a history of injuries to the skin which would indicate that traumatism is a predisposing cause. These growths may be one or more in number. They are firm, pink, freely movable and oval or elongated with claw-like processes given off which extend in all directions. Keloids assume all sorts of shapes and sizes. The surface may be smooth or nodular. Pain and pruritus may be present. The favorite location is upon the upper half of the sternum, although many cases involve the face and extreme cases may affect the greater part of the body. It runs a very slow course and is not fatal.

Leprosy

Definition.—A chronic disease of slow progress characterized by anesthesia, redness, tubercles, atrophies and deformities.

Adjustment.—Local and K. P.

Pathology.—In the tubercular type nodules form upon the skin, nerves and blood vessels in localized regions and undergo a slow breaking down with ulceration and ultimate destruction of the parts of the body affected.

In the **anesthetic** type the principal change is a slow and gradual atrophy of the skin and its underlying structure, including the arteries and arterioles, causing their obstruction and dry gangrene as a result.

Symptoms.—**Tubercular leprosy** begins insidiously with prodromes of ill health, diarrhœa, chills, profuse sweats and remittent fever. This fever may precede the other prodromal symptoms and also recurs with each new outbreak of tubercles. After a time a red eruption appears upon the face, ears, arms or legs. The eruption consists of oval, hyperesthetic, purplish spots, one or more inches in diameter, which disappears with the fever and recurs upon the return of the fever. Three to six months after the eruption the tubercles appear as pink, pinhead sized papules, which may enlarge to the size of an egg. These tubercles are anesthetic and often coalesce, making the parts affected have a nodular appearance. The tubercles usually appear upon the lips, eyebrows, ears and digits, but never in the palms, soles or scalp. The tubercles may break down, forming leprous ulcers which slough and have a peculiar odor. As a result of this ulceration there is amputation of the digits or even extremities, or they may leave large scars. All changes are very slow, so that before there is much sloughing the face is deformed and studded with tubercles, the eyebrows hairless and thick, the eyes sunken, the ears hang down, the lips protrude, the forearms enlarged and knobby, the hands deformed and the lymphatics swollen. Sight and hearing are usually lost, the voice is hoarse and offensive discharges are given off from the nose and throat. There is always sterility. The average duration is eight years. About forty per cent of the cases die from the disease, forty per cent from kidney trouble and the rest from anemia.

Anesthetic leprosy begins with shooting pains which extend down the principal nerve trunks of the extremities affected. General hyperæsthesia and itching may occur upon different parts of the skin. Frequently there is a vesicular or

bullous eruption upon the fingers or toes which become purulent, and upon breaking leaves an anæsthetic scar. Malaise, digestive disturbances and extreme muscular weakness may also exist in the prodromal stage.

After several months of prodromal symptoms a macular eruption appears upon the face, lips, extremities and back. The macules are oval in shape, pale yellow or brown in color, enlarged around the edge and clear up in the center. They are hyperæsthetic at first but soon become devoid of sensation. The large nerve trunks harden and become like whips under palpation. Areas of numbness may exist independently of the macules, and in old cases the entire skin becomes anæsthetic. The muscles of the hands and feet undergo a marked atrophy. Permanent flexion of the last phalanges of the hand gives a characteristic appearance in practically all cases of this type. Following the macules and anæsthesia of the skin it undergoes atrophy, leaving it a very pronounced white color, and toward the later stages most of the body may have assumed this color. The hair is lost, the skin is wrinkled, the nails drop off the digits or even extremities may be amputated, due to dry gangrene. Hebetude and insomnia are present in most all cases. Many cases present symptoms of both types and are spoken of as mixed forms but named according to the predominating symptoms. The average duration of this form is fifteen years and the prognosis is uncertain.

Leucoderma

Definition.—Leucoderma or leucopathia is an acquired loss of the pigment of the skin and is usually accompanied by hyperpigmentation of other adjacent parts.

Adjustment.—When primary it is a trophoneurosis of the skin, due to impingement upon the nutritive nerve supplying the affected part. Most cases are secondary or symptomatic of other diseases, such as neuræsthenia, syphilis, Addison's

disease and morphea. When symptomatic the adjustment should be made for the disease of which it is symptomatic.

Symptoms.—It usually begins upon the neck, face or hands as a small white spot devoid of normal pigment. The spots vary in shape and may be as small as a dime or so large that they cover the major portion of the body. They develop slowly and may become stationary at any time. The adjacent skin may become darker than normal, due to the deposit of extra pigment. As a rule the general health is not affected and sensation remains normal. When the scalp is involved the hair turns white. The condition is more evident in the summer months because of the tanning of the normal skin, which gives to it greater contrast.

Lichen Planus

Definition.—A chronic and inflammatory disease of the skin characterized by small, flat, angular, umbilicated, red papules with intense itching.

Adjustment.—Local with K. P.

Symptoms.—The structural changes are those of inflammation occurring in the corium around the sweat glands and papillæ. It begins with an eruption of small papules of a purple or crimson-red color one-sixteenth to one-sixth of an inch in diameter. They have small depressions in their center with a smooth and shiny surface. When fully developed the papules become gray with red borders and may remain discrete or arrange themselves into rows. When forming patches they become scaly and have no definite shape but are lilac colored. They most commonly occur upon the flexor surface of the extremities. The general health is good unless interfered with by loss of sleep from the intense itching.

Lichen Ruber Acuminatus

Definition.—It is a chronic progressive disease of the skin marked by an eruption of small red conical papules tipped with a scale.

Adjustment.—K. P.

Symptoms.—This disease begins as a discrete eruption of millet seed sized papules which have slight itching. The papules are red in color, conical in shape, hard in consistency and each is tipped with a scale. They first appear upon the flexor surface of the extremities and trunk. New papules form, enlarging the patch or area until most of the body is involved. The single papules, however, never increase in size. Later in the disease the papules may grow so close together that they form a continuous red infiltrated patch covered with scales. This gives to the skin a stiffness which interferes with movements of the joints. There is intense itching and disturbances of nutrition which is indicated by marasmus, uneven brittle nails and great prostration.

Two-thirds of all cases are found in adult males.

Lupus Erythematosus

Definition.—A chronic superficial growth of the skin characterized by sharply defined localized red patches having gray scales.

Adjustment.—Local in the upper cervical region and K. P.

Symptoms.—This form of lupus begins with pinhead sized scaly red spots, the border of which may be raised. They are situated upon the nose, cheeks, ears or scalp and grow slowly, but finally coalesce, forming large patches, having well defined raised edges. The patches are covered with gray scales, beneath which it is red or pink in color. A mild itching and burning may be present, but often there are no sensory disturbances. Usually the eruption is symmetrical, and when situated upon the nose and cheeks gives to the face a peculiar butterfly appearance, the ridge of the nose representing the back of the butterfly and the cheek its wings. When occurring upon the scalp it leads to permanent loss of the hair. The disease may become stationary after a time and the general health may be unaffected.

Lupus Vulgaris

Definition.—A localized tuberculosis of the skin.

Adjustment.—Local and K. P.

Symptoms.—The structural changes are those of tuberculosis when occurring in other parts of the body. This usually begins upon the nose and cheek as one or more deep-seated, dull red spots consisting of small papules which enlarge and coalesce. They are of an apple-jelly color and soon become scaly. They are not symmetrical, varying in size and shape. These papules are always elevated above the level of the skin. The center of the patch is much lower than the border and eventually is atrophic. In rare instances the patches entirely disappear, leaving a fine, smooth scar, but more often they break down and form ulcers which are round in shape with easily bleeding floors and a moderate amount of purulent secretion that dries into a crust. There is always a dense growth of scar tissue which causes the parts affected to atrophy and greatly diminish in size. There may be signs of the disease in other parts of the body.

Lymphangioma

Definition.—A benign growth of the skin involving the superficial lymphatics, and is also called lymphangiectasis.

Adjustment.—Local and K. P.

Pathology.—The superficial lymphatics become dilated, forming ampullary swellings at the surface of the skin which may remain discrete or become fused into masses. These swellings contain lymph, which, if drained, soon fills again.

Symptoms.—This begins as a thick-walled vesicle, several of which are crowded together in irregular shaped groups, giving to the skin a warty appearance. Each vesicle varies from the size of a pinhead to that of a half dollar and is always flat. They are usually pink in color but may contain a straw-colored serum or blood which would cause a change in the color. They spread slowly from the periphery,

with much thickening of the skin. Upon palpation they are firm and give to the skin a feeling of stiffness. Large areas of the skin may be involved by the tumorous mass, which is about one-fourth inch in thickness. There is little or no pain attending this affection. Males are more often affected than females, and as a rule the disease begins early in life.

Miliaria

Definition.—An incoordination of the sweat glands characterized by a discrete eruption of papules or vesicles.

Adjustment.—K. P. should always be adjusted. If the condition is symptomatic the adjustment would depend upon the causative disease.

Symptoms.—Miliaria is divided into two main classes known as sudamina and prickly heat.

Sudamina occurs during the course of fevers and consists of numerous, closely set, pearly vesicles without any inflammation. These vesicles dry up and disappear in a few days without any subjective symptoms. They are due to a closure of the sweat pores and retention of sweat under the skin.

Prickly heat is also called lichen tropicus and occurs during warm weather or when warmly clothed. It is characterized by an eruption of pin point papules upon a reddened skin and attended by itching, prickling and burning, which is increased by heat and moisture. These papules occur in great numbers, are closely set and may be localized or general in their distribution. This is most commonly found in children and obese individuals. It is due to a congestion around the sweat glands.

Morphea

Definition.—A chronic circumscribed hardening of the skin, and is also called Addison's keloid.

Adjustment.—Local and K. P.

Symptoms.—This begins as a red or lilac colored macule which enlarges at the periphery and becomes pale and hard in the center. It soon forms an irregular or band-like patch which becomes yellow, pink or brown in color. The skin over the patch is smooth, but when pinched between the fingers feels hard and leather-like. There may be one or several such patches, some of them being level with the skin and some being raised. Sensation is always retained in the affected area. The condition most commonly manifests itself upon the trunk, especially the breasts and on parts of the face supplied by the fifth cranial nerve. The disease has no definite course, but usually terminates by suddenly disappearing, undergoing ulceration or leaving patches of leucoderma and chloasma.

Nevus Pigmentosus

Definition.—A congenital, circumscribed, hyperpigmentation of the skin, and is also called the pigmentary mole and mother's mark.

Symptoms.—This may consist of pigment only and not raised above the level of the skin, and when such is the case it is called *nevus spilus*. There may be hypertrophy of connective tissue, causing it to be raised above the surface, giving it a warty appearance and is then called *nevus verrucosus*. If hair grows from either form it is called *nevus pilosus*. This form of nevus may be unilateral or bilateral, consisting of one or hundreds of small or large patches of a brown color. They may be located on any part of the body, but are especially common on the face, neck and back. When hair grows from the nevus it is coarser and darker than elsewhere. There are no subjective symptoms. The condition is not altered in any respect by adjustments.

Nevus Vascularis

Definition.—A reddish spot or area, due to an increase in the number and size of the cutaneous capillaries.

Symptoms.—They appear at birth or during the first month of life and are usually single but may be multiple. They vary in size, shape and color, but all become pale upon pressure. They may be but a small pinhead spot under the skin or a large erectile, pulsating tumor. They may be pink, light red, dark red or purple in color. When situated upon the face they become more pronounced upon crying, coughing or straining. They sometimes grow in proportion to the child's growth, sometimes remain stationary and occasionally disappear. They are most common on the face and head and are also called the port-wine mark.

Pemphigus

Definition.—An inflammatory disease of the skin characterized by the development of successive crops of blebs varying in size from a pea to an egg.

Pathology.—There is an inflammation of the papillary layer of the skin with a sudden effusion of serum between its layers, causing the same to be raised and filled with a fluid which becomes puriform with age.

Adjustment.—K. P.

Symptoms.—*Pemphigus vulgaris* is the common form and may begin acutely with fever or more slowly without fever. The first symptom indicating the nature of the disease is the appearance of successive crops of blebs the size of a pea to that of an egg, containing a clear fluid. As the blebs become older their contents become cloudy and purulent. The blebs occur abruptly without any sign of inflammation and have a definite line of demarcation. In a day or two they are surrounded by a red halo and gradually dry up in from three to ten days, leaving a crust, and are followed by the appearance of a new crop of similar blebs. This eruption may occur upon any part of the body but shows some preference for the lower part of the face, trunk and limbs. Itching and burning may be present to a slight degree. If the blebs are large

and numerous they coalesce, rupture and leave large ulcers which greatly impair the patient's health. The condition is then called pemphigus malignus.

Pemphigus foliaceus differs from the simple type in that the blebs are flaccid, being only partially filled with serum. They always rupture before maturing and the discharged fluid hardens into white flakes which fall off, leaving the skin red and excoriated. In time the skin looks as if scalded, being red, stiff and extremely painful. After a duration of several months or years the patient passes into the typhoid status and death results from asthenia.

Pityriasis Rosea

Definition.—An acute self-limited disease of the skin characterized by red macules that enlarge into dry, scaly, oval shaped patches.

Adjustment.—K. P.

Symptoms.—This incoordination is more common in children and young adults. It begins with an eruption of slightly elevated macules or papules on the upper part of the chest or upon the anterior part of the abdomen on a level with the waist line. This eruption spreads peripherally into oval patches whose borders become higher than their centers. After the patch becomes one-half inch in diameter, the center becomes yellow and scaly, leaving a pale red border. Later the center scales off leaving red rings which are scaly. Two or more of the rings may coalesce forming gyrate figures, which finally disappear. All parts of the body except the hands, feet and face may be affected and all stages of development of the disease are found in a well formed case. As a rule there is little or no sensory disturbance, but slight itching may be present when warm.

Pityriasis simplex is a form of scaling of the skin which is especially noticeable on the scalp, where it is known as dry dandruff. The scales are white in color and become mixed

with the hair. The hair is dry and the head itches, especially when warm. Alopecia follows after several years duration.

Pompholyx

Definition.—An inflammatory disease of the skin of the palms and soles having small vesicles which dry up and scale off.

Adjustment.—Local and K. P.

Pathology.—This is an inflammatory condition of the skin with vesicles containing a clear serum, not sweat, which is neutral or alkaline in reaction and mixed with albumin and fibrin.

Symptoms.—The onset is with burning and itching of the palms and soles or the sides of the fingers and toes. In a few hours small, clear vesicles appear, usually grouped upon a red base and may coalesce to form larger ones. They do not rupture but dry up in a few days. Their covers fall off leaving small dry red spots. If the vesicles are numerous all of the skin may peel off from the affected parts. In the slight cases the palms and soles may be dotted with small red spots having ragged edges. The back of the hands and feet are not affected. Most patients having this disease are in poor general health, having nervousness, hyperidrosis and prickly heat on some part of the body. The condition lasts a few weeks, usually confined to the summer months and always has a favorable prognosis.

Psoriasis

Definition.—A disease of the skin characterized by an eruption of round, red patches, covered with thick silvery-white, adherent flakes.

Adjustment.—Principally K. P. The important thing to accomplish is to restore elimination to normal.

Symptoms.—The primary lesion is a bright red, pinhead sized flat papule tipped with white scales. This enlarges by peripheral extension into a patch. When the patch is about

one-fourth of an inch in diameter its thick scales give it the appearance of a drop of mortar and is then often spoken of as **psoriasis guttata**. When coin sized is called **psoriasis nummularis**. A single patch may attain the size of a silver dollar and retain its round shape, but most large patches are irregular in shape, being formed by small ones uniting. The irregular shaped patches give to the skin a map-like appearance, from which they obtain the name **psoriasis geographica**. Upon maturing the center of the patch clears up, leaving a ring called **psoriasis circinata**. When the greater part of the body is affected it is called **psoriasis universalis**.

Every case does not exhibit all of these symptoms but in all cases an area of redness extends a little beyond the scales. The scales are constantly shed and renewed, they are readily scraped off with the nails and leave a glistening membrane having red dot-like spots or points. The scales are silvery-white or gray in color, darker scales being due to a mixture of dirt or blood. The skin is always dry, never having a moist discharge. Psoriasis may occur upon any part of the body but is most frequently seen on the elbows, just below the knees and upon the scalp. When found on the scalp it is more apt to spread to other parts of the skin. A red scaly line on the forehead just below the hair line is very characteristic of psoriasis. Usually the hair does not fall out, but if alopecia does occur it is only temporary. In old cases the skin may be greatly thickened and fissured and the finger nails may be fissured transversely, discolored and cracked. Itching may be present at times but is of little importance in recognizing the disease. Most cases are better during the summer months and worse in cold weather. Most cases begin before the thirtieth year. The prognosis is favorable.

Scleroderma

Definition.—A chronic disease of the skin characterized by thickness and rigidity.

Adjustment.—K. P.

Symptoms.—This affection is most common in young or middle-aged women and may begin anywhere, but usually on the upper half of the body. It may begin with symmetrical patches or develop on all parts of the body at once. The principal feature of the disease is that the skin is hard and cannot be pinched into folds. This firmness is due to an infiltration of serum and cells in the subcutaneous tissue and to the fact that the skin is firmly attached to the deep underlying structures. The skin is of normal color, scaly and does not pit upon pressure. When occurring in patches their outline can be better felt than seen. The stiffness of the skin may interfere materially with movement of the joints. Late in the disease the face may become involved so that the eyelids cannot be closed and the facial expression remains unchanged. Respiration may be suppressed from the inability of the chest to properly expand. The temperature of the skin may be lowered due to interference with the cutaneous circulation. Sensation is finally altered and the second stage supervenes. The second stage is called the atrophic stage, being characterized by a progressive atrophy causing the whole body to have a shrunken, corpse-like appearance. Although marasmus may be extreme the general health is not materially affected and the patient may live many years.

Sebaceous Cyst

Definition.—A small tumor of the skin due to the retention of sebum in the sebaceous glands. It is also called a wen.

Adjustment.—Local and K. P.

Symptoms.—Wens may occur anywhere on the cutaneous surface but are most common on the scalp, face, neck and back in the order named. They vary in size from millet seed to an orange but are usually slightly less than a small marble. They are round in shape and when small a part of their contents may be pressed out. The skin over them is pale due to pressure anemia of the overlying cutaneous capillaries. At first they are elastic or doughy to the touch but as the con-

tents solidify they become hard and firm. They grow slowly without any subjective symptoms. When occurring on the scalp there is no hair upon the skin over the cyst.

A wen differs from a lipoma in that the latter is larger, firm from the beginning, lobulated, more flat in shape, more numerous and rarely found upon the scalp.

Seborrhea

Definition.—A secretory disorder of the sebaceous glands characterized by hypersecretion of sebum which may be too fluid or too solid, forming an oily coating or greasy crusts on the skin.

Adjustment.—K. P.

Symptoms.—The normal secretion of sebum is not visible to the naked eye but when secreted to excess and of fluid consistency it gives the skin a greasy appearance and is called **seborrhea oleosa**. The extent of the secretion varies from enough to give the skin a slippery feeling to large drops or beads of oil. This oil catches dust, which mixes with it, giving the skin a dirty appearance, and is most noticeable on the skin of the nose, forehead, chest and shoulders. When the secretion is thick, forming crusts, it is called **seborrhea sicca** and is most commonly found on the scalp where it forms one of the varieties of dandruff. These crusts of oil collect around the roots of the hair and are of yellow color. The entire scalp may be involved but as a rule the crown and vertex are affected more pronouncedly than the rest of the scalp.

Sycosis

Definition.—An acute or chronic inflammation of the hair follicles of the face characterized by papules and pustules perforated with hairs and by much crusting.

Adjustment.—Middle cervical and K. P.

Symptoms.—This disease is also called folliculitis barbæ and by some authors barber's itch. However, it should be borne in mind that this is not the true barber's itch.

The disease begins with a formation of numerous red papules, conical in shape, raised above the surface and always perforated by a hair and is preceded or accompanied by disagreeable sensations of prickling, burning, smarting or a feeling of tension in the skin. The papules vary from millet seed to pea in size and soon form pustules which preserve the same characteristics. The discrete conical shaped discrete pustules perforated by hairs are pathognomic of the disease. The pustules undergo no rapid change but in time the pus appears upon the surface in thin crusts which never become thick and is appreciable only when the beard is growing. In severe cases small cutaneous abscesses may form with enlargement of the neighboring lymphatics. The pus destroys the hair follicles and hairless spots on the bearded region of the face may result. It may involve the scalp, eyebrows and axilla, but shows no tendency to spread to non-hairy parts of the body. The disease may become chronic after many recurrent attacks.

Trichophytosis Corporis

Definition.—An incoordination of the skin and hair characterized by the formation of circular or annular scaly patches and partial loss of hair.

Adjustment.—K. P. and local.

Symptoms.—This is the simplest form of ringworm and begins as a small pale red slightly raised spot which spreads out into a round sharply defined scaly patch. The center of the patch clears up, leaving a ring shaped border which may be vesicular or crusted from the drying of the vesicular contents. There may be a single patch or they may be numerous and occur in groups. If two patches meet at their peripheries they coalesce and form gyrate figures. In some cases the center of the patch does not clear up and it then remains round, slightly raised and scaly. The exposed parts of the body are most common sites for the eruption but in rare cases ringworm may spread all over the body.

Eczema marginatum is a form of ringworm that is located in the groin or axilla. It is usually of a more highly inflammatory character than when found in other parts of the body. The edge of the patch is sharply defined, raised, scalloped, papular and scaly while the center may be smooth or but slightly crusted. The patch often becomes large, running down along the inner surface of the thigh over the lower part of the abdomen and backward over the perineum. Usually the inside of both thighs are affected. There is considerable itching. When occurring in the axilla the same symptoms will appear.

Trichophytosis Capitis

Definition.—This is called ringworm of the scalp and is found only in infants and children.

Adjustment.—K. P. and local.

Symptoms.—This form of ringworm is found only in children, it disappearing about puberty regardless of how severe it may have been previously. It begins as a single vesicle or as a small scaly patch. From this small beginning the spot spreads to form a large circular patch which is red covered with gray scales, sharply defined, slightly elevated and partially bald. The patch contains many broken off hairs with split ends. The hair in and around the patch is dry and lusterless. The patch may vary from the size of a ten-cent piece to a large area covering most of the scalp. When small patches coalesce to form large ones they lose their circular outline and become scalloped. When they become one inch in diameter they stop growing and remain stationary.

The one or more patches are attended by itching, which is the first symptom to attract attention to them. The most frequent locations are the vertex and parietal regions.

Trichophytosis Barbae

Definition.—It is also called ringworm of the beard and barber's itch.

Adjustment.—K. P. and local.

Symptoms.—At first it forms a scaly circular patch which increases in size, producing broken off hairs and a partially bald area. There are usually several of these areas on the chin, cheek and neck. This is followed by the development of pustules which are situated upon the patch and are pierced by hairs, or a group of large nodular swellings from the size of a pea to that of a cherry may develop upon this circular patch. These nodules are red or purple in color, round in shape and prominently raised above the surface of the skin. They rarely suppurate, but may give off a sticky exudate or may remain hard and scaly. There is always some itching and burning attending these lesions. This differs from sycosis in that it affects the lower part of the face, sparing the upper lip, has broken off hair and grouped nodules, while sycosis is more acute, has no nodules and its pustules are discrete.

Urticaria

Definition.—An acute or chronic disease of the skin characterized by the formation of wheals. It is also called nettle rash and hives.

Adjustment.—K. P. in combination with S. P.

Pathology.—Urticaria is a vaso-motor disturbance which is at first characterized by a spasm of the vessels in a localized area and immediately followed by their dilatation. A serous exudation ensues, forming the wheal, which is pink at first but later becomes white. The vaso-motor disturbance is the result of a toxin in the blood which forms in the digestive tract when there is improper digestion and because of poor elimination is permitted to remain in the body coming in contact with the skin.

Symptoms.—Most cases of hives are acute in nature, beginning with wheals, which are firm, flat, circumscribed elevations of pink color. If they are greatly swollen may become white in the center, leaving a red border or areola. They

are always discrete and may vary in size, but usually are about one inch in diameter. They are not symmetrical but usually develop on both sides of the body and as a rule are not limited to any particular part. Each wheal may last from a few minutes to a few days, always being of a temporary character. They itch, burn, tingle and new ones form as the older ones disappear, recurring throughout the duration of the disease. In rare cases the wheals appear only at night and disappear during the day. The patient often describes the lesions as resembling mosquito bites, which they do to a great extent. Wheals may be produced in a patient having the disease by drawing the nail across the skin or by giving it a sharp tap. The acute cases may begin with or without fever and always disappear without roughness, scaliness or desquamation of the skin. The duration is about one week.

Chronic urticaria differs from the acute only in duration, it lasting for months or years. As a rule the eruption is less extensive and if itching has been present excoriations and pigmented areas will be found upon examination of the skin. The wheals may assume different appearances in different cases, some being small, some large, others surmounted with a papule and still others immensely edematous and the seat of hemorrhage. The prognosis is always favorable under Chiropractic adjustments.

Syphilis

Definition.—A chronic disease of slow progress, characterized by an initial lesion called the hard chancre and in the second and third stages by various cutaneous lesions.

Pathology.—See Syphilis in section on febrile diseases. /

Symptoms.—The **primary stage** is characterized by the appearance of the hard chancre, two to six weeks after inoculation. In ninety per cent of the cases it is located upon the genitals. It always has a hard indurated base with a well defined margin. Upon the hard base the initial lesion may take on the form of a scaly patch; a dry or moist papule; a

superficial erosion or a circumscribed ulcer having perpendicular edges. Usually but one chancre appears in a single case but they may be multiple. They give off a serous secretion and disappear in two or three months leaving a scar. During the initial stage the nearby lymphatics become painlessly enlarged, but remain freely movable and rarely suppurate. About six weeks after the appearance of the initial lesion the skin becomes the seat of eruptive lesions called syphilides. With their appearance there is headache, malaise, sore throat and pains in the joints. The eruption is divided into two groups known as secondary and tertiary syphilides.

Secondary Syphilides.—The first secondary lesion to appear is called the macular syphilide or syphilitic roseola. It consists of circular hyperemic spots of the face, trunk and flexor surface of the extremities. They are of a faint rose red color, becoming purple when exposed to the cold and vary in size from that of a split pea to a dime. They disappear on pressure. Each macule lasts a week or ten days when it may entirely disappear, leave a pigmented spot or form a papule. New macules form from time to time and may be intermingled with papules and pustules, but the macules always predominate.

These macules differ from those of the eruptive fevers by the absence of fever, catarrhal and gastric symptoms, and by the slow changing of the macules. They differ from chromophytosis in that the macules are red, not brown, are not scaly and not capable of being removed by scraping. Most other skin diseases having macules can be differentiated from syphilis in that their macules are smaller, scaly and not so general in their distribution.

The papular syphilide usually follows the macular, but may be the first eruption to appear. The papules vary in size from that of a pea to one inch in diameter. They are round, red, firm and after forming undergo changes slowly. The center of the papule sinks, becomes scaly and then is gradually absorbed. They are very general in their distribution but

are sometimes grouped. When the papules are very large they are called the lenticular papular syphilide and if small are called the miliary papular syphilide.

In these large lenticular syphilides the superficial layer of the epidermis is absent at their centers, causing them to have a ragged edge near the base. This is an important diagnostic sign. They are bright red at first but later they become the color of raw ham. When occurring upon the face they often group along the hair line and form pustules that crust. They commonly appear in goodly numbers on the palms and soles. They last from one to two months, leaving marked spots which later disappear. If they become pustular they are called the papulo-pustular syphilide, and upon becoming scaly are called the papulo-squamous syphilide.

The moist papule or mucous patch is a modified form of the lenticular syphilide occurring upon mucous membranes or where two folds of the skin rub together. They are circular in shape, have a flattened surface, a depressed center and a dull red color at first, but are soon covered with a white coating. Their duration is long and they are considered to be one of the most highly contagious of all syphilitic lesions.

The miliary papular syphilide is not so common as the lenticular. They are conical in shape, pinhead in size with depressed centers and are grouped around the hair follicles. When arranged in patches they become scaly, resembling psoriasis, but are not localized on the extensor surfaces of the extremities and have no itching, with but little scaling. Upon disappearing they leave pigmented spots and sometimes permanent pits.

The pustular syphilide is the last eruption belonging to secondary syphilis and may occur early or late during this stage. This lesion usually follows the former ones but may occur primarily and always denotes a poor condition of the general health. These pustules may be attended with a slight fever of irregular course and indefinite duration. The pustules may be large or small in size and have a hard red base and

an inflamed areola. The eruption may be general or localized, drying up in a few days after forming and become covered with a yellowish brown crust which soon falls, leaving a pigmented pit that in time disappears. The small pustules are called the **military pustular syphilide** or **syphilitic acne**. They are most common during the middle of the first year of the disease, being grouped on the trunk, face and extremities.

The pustular syphilide can be differentiated from the other pustular disease, because of having an infiltrated base, being more general and always having one or more symptoms indicating syphilis.

Tertiary Syphilides.—The eruptions of this stage may occur as early as the second year or as late as the twentieth year but prior to their development there may be relapses of macules, papules or pustules. The tertiary lesions are tubercles or nodules, the squamous, the pustulo-crustaceous, gummatous and ulcerative.

The **tubercular or nodular syphilides** occur as clusters in the deep parts of the corium, are light red at first but darken with age. Each individual nodule varies from the size of a pea to that of a hazel nut. They are round, firm, smooth and somewhat elastic protuberances often arranged in circles or semicircles. There may be one or more groups of this character occurring upon the back, neck and face. They are few in number if they occur late in the disease. They disappear by absorption or by breaking down, forming a sharply cut ulcer with a perpendicular edge. If several of these lesions break down at once and coalesce they form a large ulcer having scalloped edges. These ulcers are always covered with a thick greenish crust which softens and is easily removed when moistened. As a rule they progressively but slowly enlarge and have no subjective symptoms. Upon healing they leave a scar like that of a burn.

The **squamous syphilide** is usually not considered as an individual lesion but rather a scaliness of the other forms. They are usually papules or tubercles which are scaly and

occur after the second year. They are most commonly found upon the palms and soles where they form circular or ring shaped figures. This is differentiated from squamous eczema of the palm by the fact that in syphilis there is little or no itching, often unilateral, more infiltration and the lesion is often crescentic in shape with healthy skin between the horns of the crescent.

The **pustulo-crustaceous syphilide** is characterized by large deep-seated pustules or ulcers which are covered by prominent and peculiar crusts. These lesions always occur late and are always localized on the scalp, face and extremities, but rarely affecting other parts. They assume three forms, viz., the **ecthymatous**, **rupial** and **pemphigoid**.

(a) The **ecthymatous** form begins as one or more round flat pustules one-fourth to one-half inch in diameter, sometimes becoming as large as a half dollar. Their base is hard and swollen and surrounded by an inflamed areola. The pus dries and forms a green or dark brown crust, the center of which is depressed. As the crust dries it becomes detached from the edge of the sore and is easily removed. Beneath the crust is a thick pus that soon dries, forming another crust. If the sore is washed out upon removal of the crust the typical syphilitic ulcer with its perpendicular edges is seen. This ulcer may heal and leave a scar like that of a burn, but if it does not heal forms the ulcerative syphilide.

(b) The **rupial** form is also called **rupia** and is characterized by a conical laminated crust over a superficial ulcer. This may begin as a superficial pustule or bulla upon which a greenish crust develops and under which suppuration exists. The margin of the ulceration extends a little beyond the original crust. A new crust forms beneath the old one, raising it up. After this has been repeated a few times the crust becomes arranged in layers one-half inch in thickness and about two inches in diameter. If the lesions are numerous the ulcers are usually small and if few they are large. If the

ulceration occurs more rapidly at one end of the sore than at the other it will be found that the crust is uneven in thickness.

(c) The pemphigoid or bullous form is very rare in acquired syphilis and common in the transmitted form. It consists of an eruption of superficial, purulent, flattened bullæ one-fifth to one inch in diameter. They are surrounded by a dull red areola and soon become covered with dark green crusts which are closely adherent.

The gummatous syphilide is one of the most common and characteristic lesions of late syphilis. It consists of a deposit of gummy material in the subcutaneous tissue from which it extends into the skin. It may take on the form of a single tumor, a group of nodules or a diffuse infiltrated patch. It may undergo absorption and disappear or break down and ulcerate. A single gumma begins as a small pea sized structure beneath the skin and grows slowly, requiring several weeks or months to attain the size of a hazel nut. They are freely movable, firm, elastic, painless and roll under the skin. As it increases in size it becomes movable and the skin over it assumes a red color. It may feel soft upon palpation but will not discharge any amount of fluid when opened. The scalp and forehead are the favorite locations for the formation of gumma, where they may become as large as a hen's egg. If the gumma undergoes ulceration a deep round ulcer is formed. A gumma differs from malignant tumors and abscesses in that it is not attended by pain and will fluctuate under pressure as it increases in size. When involving the skull bones, has crepitus and when opened gives off a small quantity of bloody serum.

The ulcerative syphilide always results from other lesions of the disease, usually tubercular, pustulo-crustaceous or gummatous and are divided into three classes, viz., superficial, serpiginous and deep or perforating.

(a) The superficial ulcer is circular in shape with

sharply cut edges, a dirty yellowish purulent base the size of a quarter to half dollar and occurs on the face and legs. They may occur early in the disease and nearly always result from the pustulo-crustaceous syphilide.

(b) The serpiginous ulcer is so named because it tends to creep over the surface leaving a cicatrix as it passes along. It may develop from other ulcers, tubercles or pustules and creeps in a circular manner. The tissue in the center has a normal appearance, an important differential sign from other similar ulcers. It is most often seen on the back and the extremities, is not painful and does not necessarily impair the patient's health.

(c) Deep ulcers form from a breaking down of gummatous deposits and have a crater like cavity, due to the opening being smaller than the softened mass. If they are numerous in one location they may coalesce beneath the skin, involving the deep structures. Their course is indefinite, as they may perforate or heal.

Zoster

Definition.—An acute inflammatory incoordination of the cutaneous nerves characterized by a unilateral eruption of groups of vesicles situated upon a reddened base and found along the course of the affected nerve. It is also called herpes zoster and shingles.

Adjustment.—Local with K. P.

Pathology.—The structural changes are those of simple inflammation involving the substance of a cutaneous nerve with its posterior ganglion and the papillary layer of the corium.

Symptoms.—The first stage is that of neuritis, lasting for a few days or several weeks and marked by slight or severe pains. These premonitory pains are followed by the appearance of an eruption consisting of groups of small papules, which soon develop into tense vesicles. These vesicles vary in size from a pinhead to a split pea or larger and always have

a red base. The vesicles may become turbid, dry up and disappear and be followed by other groups of vesicles. Mild cases usually terminate in a week or ten days, while severe cases may last weeks or months, during which the lesions are attended by severe burning and stinging pain. The most common location is one or two intercostal nerves from the spine to the sternum, but may affect nerves of the head and extremities. It is not uncommon to find this eruption following the course of the supraorbital branch of the trifacial nerve. The number of vesicles vary from two to hundreds in a group and they may coalesce, forming blebs.

It differs from herpes simplex in that it is usually unilateral, its vesicles do not break to form crusts and it is always accompanied by pain of a neuralgic character radiating along the course of the affected nerve. The prognosis is always favorable under adjustments.

Varicose Veins

Definition.—A localized or circumscribed dilatation of the superficial veins.

Adjustment.—Local with K. P. Most varicosities are found in the lower extremities, hence the local adjustment is a lower lumbar.

Pathology.—From a causative standpoint these dilations may result from venous obstruction, due to pelvic, abdominal or thoracic tumors which press upon the vessels draining the affected part or the inferior vena cava; or it may be produced from diminished cardiac power associated with involution of the vein wall. In all cases the vein wall is stretched, causing it to assume a saccular or pouch-like formation.

Symptoms.—Varicose veins are common in both sexes, but are more common in fleshy people and those following occupations where they are required to stand for long periods at a time. The appearance of the varicosity is gradual with aching pains in the legs. The veins are darker in color

than the blood they contain, due to intensification of the color in transmission through the skin. One or both legs may be affected and the dilations which vary in number may extend from the hip to the ankle. Most commonly they are found on the calf of the leg and the inner surface of the lower portion of the thigh. They vary in size from slight distentions to enormous varices one to two inches in diameter. If the relaxation of the vessel walls be very great there may be hemorrhages, both external and beneath the skin. Those occurring beneath the skin cause it to have a purplish-black color, and after repeated subcutaneous hemorrhages the overlying skin remains permanently pigmented. The broken skin at the point of hemorrhage often becomes the site of varicose ulcers.

Varicose ulcers are most commonly located on the anterior surface of the lower half of the leg and may be superficial or deep. They are irregular in shape with sloping or undermined edges and are surrounded by a wide zone of redness and infiltration. Their bases are covered with flabby granulations, a scanty secretion or a purulent exudate. They may be single or multiple on one or both legs. The foot and leg are greatly swollen from the edema. This edema is greater after standing and is lessened by keeping the body in a horizontal position. The ulcers are tender and the patient complains of considerable pain. Upon healing they leave large scars. The prognosis is good under adjustments at K. P. and lower lumbar, sacrum or ilium.

SECTION 18

HERNIA AND HEMORRHOIDS

Hernia

Definition.—A swelling formed by the displacement of a soft part, which protrudes through a natural or artificial opening from the cavity in which it is normally contained. Derived from Latin, meaning a rupture, a burst or a descent.

Classification.—1. Femoral hernia.

(a) Complete.

(b) Incomplete.

2. Inguinal hernia.

(a) Direct.

(b) Complete oblique or scrotal.

3. Umbilical hernia.

Any of the above may become strangulated. Any of the three cavities of the body may be the subject of hernia, but those of the cranium and thorax are extremely rare and usually the result of traumatism, hence are not considered here. Many parts of the abdominal wall may become the seat of hernias, but they most commonly appear in the front, lower regions, which, being destitute in great measure of muscular fibres and being the site of many of the openings leading from the abdomen to the lower extremities, offer less resistance to the displacement of the viscera.

Pathology and Deranged Anatomy

Femoral hernia. A portion of the intestine passes through the femoral or crural ring, the upper opening of the femoral canal. A pouch of the peritoneum is forced before the intestine and is called the hernial sac. If the viscus does

not pass through the saphenous opening it is called an **incomplete femoral hernia**, and when protruding through the saphenous opening is called a **complete femoral hernia**. The coverings of a femoral hernia are: peritoneum, subserous areolar tissue, septum-crutale, crural sheath, superficial fascia and skin.

Inguinal hernia. A portion of the intestine passes through the internal abdominal ring, the conjoined tendon or aponeurosis of the internal oblique or transversalis muscles, into the inguinal canal and protrudes through the external abdominal ring. If the viscus escapes through the external abdominal ring into the scrotum it is called a **complete oblique inguinal hernia** or **scrotal hernia**. A direct inguinal hernia is one in which the protrusion makes its way through some part of the abdominal wall internal to the epigastric artery. In most cases being forced through the conjoined tendon, or the tendon is forced along before the viscus, forming one of its coverings. If the hernia, with its sac, can be replaced it is said to be reducible, and as a rule is not very troublesome unless it attains great size. A hernia is said to be **strangulated** when it is not only irreducible but also subjected to a continual constriction; this constriction may be produced by different causes, but usually occurs at the internal abdominal ring where a few fibres of the internal oblique or transversalis muscles contract, pinching the protruding viscus. The coverings of an inguinal hernia are peritoneum, subserous areolar tissue, cremaster muscle and fascia, intercolumnar fascia, superficial fascia and skin.

Umbilical Hernia. Some of the abdominal viscera protrudes through the umbilicus by stretching the remains of the umbilical cord and passes between the two recti muscles. The size and extent of the contents are variable.

Adjustment.—Femoral hernia—lower lumbar. Inguinal hernia—usually middle lumbar but may be any lumbar vertebræ. Rarely as high as the 12th dorsal vertebræ. Umbilical hernia—lower dorsal or upper lumbar.

Symptoms.—Inguinal hernia is by far the most common form and predominates in the male sex. Any circumstance which diminishes the resistance of the abdominal walls or breaks the equilibrium existing between them and the viscera, which react and mutually press upon each other, would have an etiological bearing on hernia. The simultaneous contraction of the diaphragm and the abdominal muscles which takes place on every violent effort is one of the chief of these causes. When a hernia is produced suddenly by traumatism it is attended by great pain in the region of the protrusion. Inspection will show a visible and palpable swelling external to the external abdominal ring. The swelling is very hard and oblong in shape, the long axis usually being parallel with Poupart's ligament. Within a few days or weeks all pain subsides, except when straining, which most patients with hernia will aim to avoid. Inguinal hernia may be unilateral or bilateral and is often said to be single or double according to the number. Most cases of inguinal hernia are reducible by taxis, and when reducible and having no matted adhesions which would tend to hold the displaced viscus in the canal the prognosis is favorable under Chiropractic adjustments. Many cases of long standing respond slowly or fail to respond, due to these adhesions and atrophy of the structures normally holding the viscus in place because of its prolonged non-use.

When inguinal hernia becomes strangulated it is always attended by great pain, localized in the region of the hernia, nausea, persistent vomiting, which may be of a fecal character, and later development of the signs of gangrene, which is due to obstruction of the vessels in the compressed viscus.

In femoral hernia the protrusion is below Poupart's ligament in the upper and inner part of the thigh. They are usually small in size and difficult to palpate because of being abundantly supported by the fascia and muscles of the thigh. A femoral hernia is hard under palpation and most of them are of the incomplete type. This form of hernia is most commonly found in the female sex.

An umbilical hernia can always be detected by inspection and further verified by palpation. Most umbilical hernias are small and contain but a small loop of the intestine. Rare cases have been known, however, in which the hernia contained the liver, stomach and the bulk of the small intestines.

If patients have been wearing a truss or other support prior to taking adjustments it is wise that they continue to do so until the weak parts become so strengthened, by the adjustments, that protrusion of the viscus is prevented. Hernia is but a motor neurosis, due to local vertebral subluxations pressing on the motor nerve fibres leading to some part of the abdominal muscles, causing them to weaken and relax, permitting the viscus to protrude through the dilated opening or through the separated fibres constituting a hernia. Chiropractic adjustments release the pressure upon the motor nerve fibres, thus restoring the transmission and permitting the normal expression of the motor impulses in the affected muscles.

Hemorrhoids or Piles

Definition.—Hemorrhoids are tumors chiefly composed of dilated blood vessels, hypertrophied connective tissue or blood clots situated beneath the mucous membrane of the anus or rectum.

Adjustment.—The primary cause of hemorrhoids is a lower lumbar subluxation, but many cases may be shown in which the hemorrhoid was produced suddenly during severe muscular strain, such as heavy lifting, etc. Costiveness, constipation, overeating, prolonged standing, etc., when the tissue of the rectum is weakened by the local subluxation, tends to bring about the development of hemorrhoids and is often assigned as being the secondary or exciting cause.

Pathology.—**EXTERNAL HEMORRHOIDS** are those occurring below the margin of the anus and are classified as thrombotic, varicose, inflammatory and connective tissue. **Thrombotic hemorrhoids** of the external variety are usually

produced by thrombosis of the inferior hemorrhoidal veins or rupture of the vessel and clotting of the effused blood in the adjacent tissue.

Varicose external hemorrhoids are produced by a varicosity or localized dilatation of the subcutaneous veins around the anus and are very apt to occur during heavy lifting or straining.

Inflammatory external hemorrhoids result from an inflammation of the folds of the anus, causing them to become swollen and edematous. They are pear-shaped and the small end often extends within the external sphincter.

Connective tissue hemorrhoids are also called fleshy piles and consist of hypertrophied muco-cutaneous tissue about the margin of the anus. Sometimes this connective tissue contains much fat.

INTERNAL HEMORRHOIDS are those occurring above the margin of the anus and are classified as thrombotic, varicose, capillary and mixed.

Thrombotic and varicose internal hemorrhoids differ from the external varieties only in the position in which they are found in the rectum. Those of the internal variety are found higher up in the rectum and affect the superior hemorrhoidal veins. The varicose internal hemorrhoid is the most common of all forms. **Capillary hemorrhoids** are small raspberry-like developments of the arterial capillaries of the rectal mucosa, resulting from dilatation of their walls. The term mixed hemorrhoid is used to describe a condition where external and internal hemorrhoids exist at the same time, and structurally may be any of the above described types.

Symptoms.—**Thrombotic external piles** begin suddenly while under some severe muscular strain when the patient feels a slight pain in the region of the anus. Examination will show a small round swelling, which is blue in color, due to the obstructed vessel containing deoxygenated blood. Pain and tension are increased for the first few hours. The patient is unable to sit and movements of the bowels are most

distressing. Within 24 hours the pain is less acute but sensations of weight and aching continue, being more severe with each movement of the bowels.

Varicose external piles consist of one or more circumscribed dilatations of the vessels around the anus. They increase in size at each movement of the bowels when there is any straining and are common in people who are constipated or follow occupations demanding much muscular strain. They may be made to disappear temporarily by elevating the hips, as this position aids gravity in draining the veins. They begin slowly without pain or protrusion, and when small most patients are unaware of their existence. The pile is of a dark bluish color and forms a cushion-like mass around the anus. When becoming large they protrude and have a great tendency to bleed. This form of hemorrhoids yields very readily to adjustments of the lower lumbar vertebræ.

Inflammatory external hemorrhoids may be single or multiple and begin with itching, burning and a sense of uneasiness. Examination shows an oval swelling about the size of a hazel nut to that of a small egg. They are deep red in color, painful to the touch, not very hard and are often covered by mucous membrane which has been dragged down from its normal position in the rectum. When much inflammation exists there may be a spasm of the external sphincter which makes the sitting position most impossible. Defecation is dreaded and most painful, therefore most cases are constipated, due to the voluntary retention. Between two of the piles may be found a small fissure or ulcer or a pocket filled with fæces. The inflamed structures may ulcerate and slough, leaving a scar, shrink and disappear with the inflammation or become chronic and form connective tissue piles. Lying upon the side with the hips elevated is the most comfortable position. Usually some relief can be obtained by a very few adjustments and most all cases recover in time.

Connective tissue piles are not painful, do not bleed and have no peculiar outline or color. They may be single or mul-

tiple, thick or thin and pedunculated or flat at their bases. As a rule they protrude to a marked degree and may become inflamed by the irritation of prolonged sitting upon a hard surface, passing hard, dry stools, etc. If they become inflamed they are then painful. These cases are slow to respond under adjustments.

Thrombotic and varicose internal hemorrhoids differ from the external variety only in the position in which they are found in the rectum. Those of the internal variety are found higher in the rectum and affect the superior hemorrhoidal veins.

Varicose internal piles are the most common of all varieties and are first indicated by two cardinal symptoms, bleeding and protrusion. When the pile is not inflamed there is little or no pain present, but the amount of hemorrhage may be very great. The bleeding in internal piles usually occurs after the passage of the fecal mass. It is of a dark red color but may brighten after being exposed to the air. Blood coming from higher in the intestine is of a tarry black color, is mixed with the feces and will turn pink when placed in water. Protrusion does not occur until the hemorrhoids have attained considerable size and then takes place gradually. At first they come down but a short distance and appear to the patient as an incompleated stool. During the early stages they recede readily, but as they become larger and extend farther down it is difficult to replace them, as the sphincter in contracting obstructs the flow of blood, causing them to swell extensively. When pressed upon by a contracted sphincter the pain may be very severe. There is always more or less mucus passed from the rectum and when abundant is sometimes called white hemorrhoids. It forms as an exudate from the inflamed mucous membrane.

Capillary hemorrhoids are small raspberry-like developments of the arterial capillaries close to the surface of the mucous membrane of the rectum. They are covered with a very thin layer of epithelium which is easily ruptured, causing

frequent hemorrhages. They do not protrude and are very difficult to locate upon digital examination. They very closely resemble the capillary nevus and for that reason are sometimes called nevoid hemorrhoids. They are also often called **blind bleeding piles**. When they have existed for some time the dilatation becomes so great that it involves the veins and the adjacent connective tissue so that a varicose venous hemorrhoid is the final result. **Mixed hemorrhoids** is the name applied to those cases in which both the superior and inferior hemorrhoidal veins are involved in the varicosity with symptoms of each variety resulting. The division between them is always clearly marked by the so-called white line of Hilton. This line marks the attachment of the external sphincter to the lower end of the gut. The existence of this line with piles before and below it constitutes the condition known as mixed piles.

Prolapse of the Rectum

Definition.—A partial or complete protrusion of the rectum or its mucous membrane through the anus; thus the term may signify any form or degree of descent of the rectum.

Adjustment.—Lower lumbar.

Pathology.—This consists of an exaggeration of the normal physiological exertion which occurs at every defaction. The elastic tissue which draws the mucous membrane back becomes stretched and permanently elongated, failing to draw the mucous membrane upward and also allowing the rectal wall to prolapse.

Symptoms.—This condition begins very gradually without pain, itching or discharge of any kind. After gradually increasing for a time discomfort is produced and hemorrhoids develop. The extent of the protrusion varies from one-half to two inches. At first the membrane is normal in color, but if it becomes inflamed is red or purplish. Upon the development of inflammation there is pain, bleeding and often ulceration. The prognosis is very favorable under adjustments.

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